EPSON

EPSON France S.A.

EPL-N1600

Manuel technique

SERVICE MANUAL

A4 Network Laser Printer

EPSON EPL-N1600

COLOR IMAGING EPSON

EPSON®

4009770

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE

1. EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPL-N1600. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS
Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

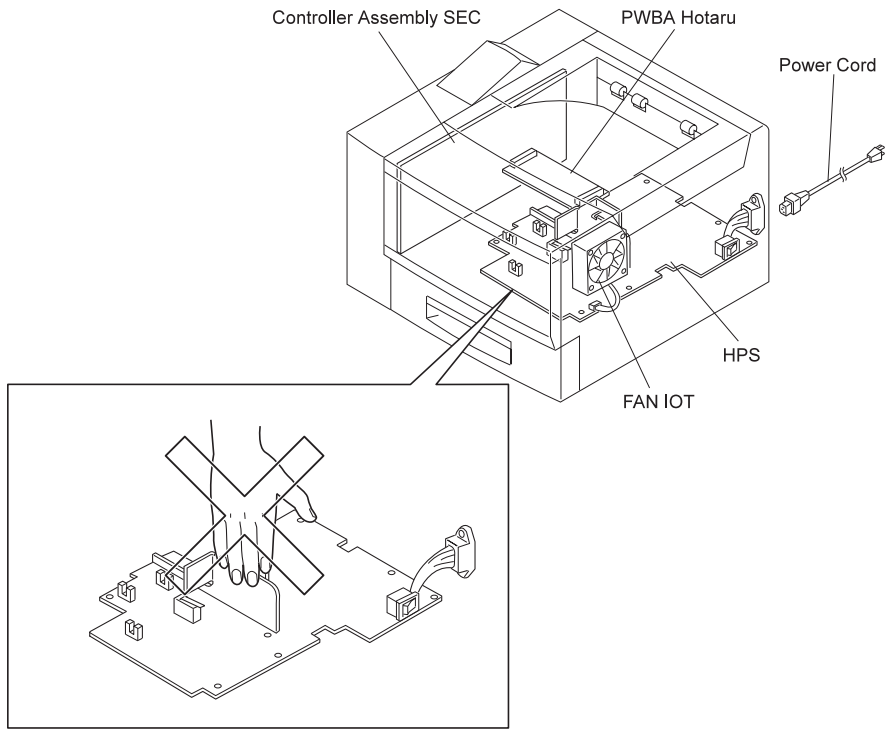
Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Safety Information

To prevent accidents during a maintenance procedure, strictly observe the Warnings and Cautions. Do not do anything that is dangerous or not within the scope of this document.

Do not do anything that is dangerous even if not specifically described in this manual. In addition to the descriptions below and those given in this manual, there are many situations and circumstances that are dangerous. Be aware of these when you are working with the printer.



Safety Precautions

POWER SUPPLY AND ELECTRICAL COMPONENTS

Before starting any service procedure, turn off the printer and unplug the power cord from the wall outlet. If you must service the printer when the power is applied, be aware of the potential for electrical shock and do all tasks by following the procedures in this manual.

WARNING

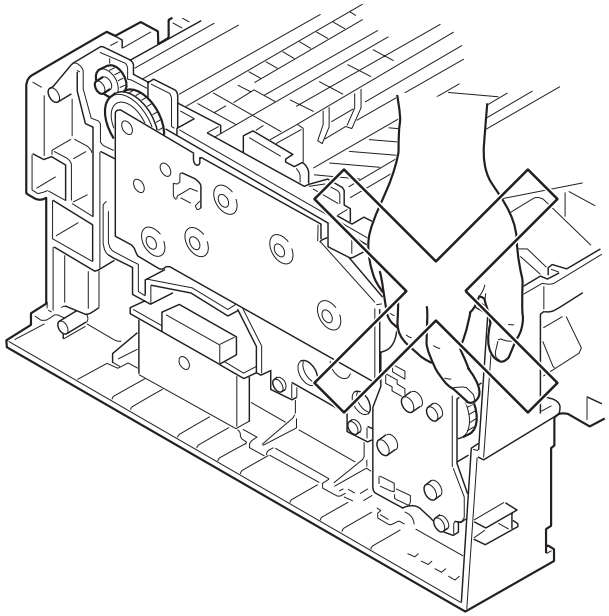
Do not touch electrical components on the HPS unless you are instructed to do so by a service procedure.

MECHANICAL COMPONENTS

If you service a driving assembly (e.g., gears), first turn off the power and unplug the power cord. Then manually rotate the assembly.

WARNING

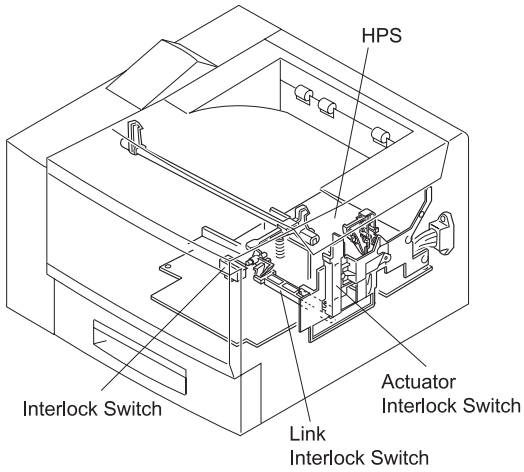
Do not touch the driving part (e.g., gears) while the assembly (printer) is being driven.

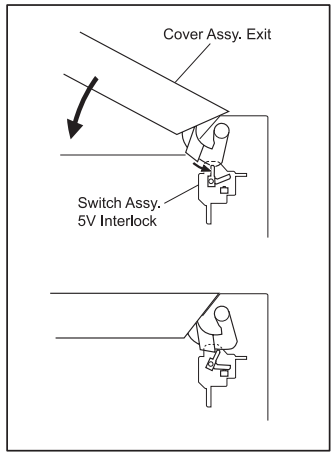


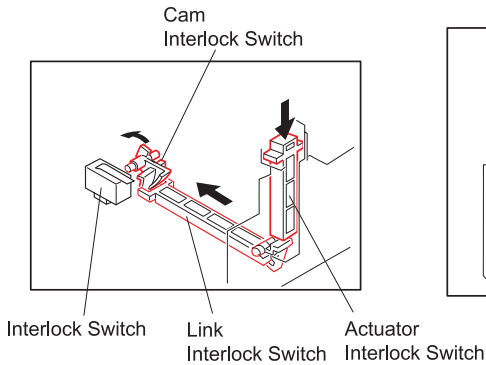
Safety Components

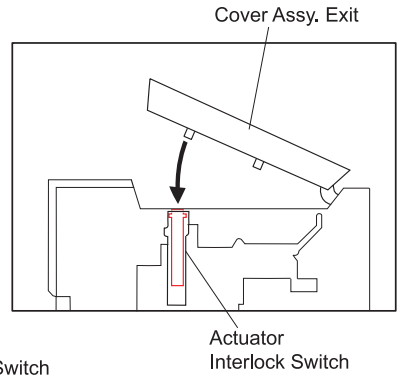
The printer is equipped with safety components (e.g., interlock switches, fuses, thermostat) and safety switches for protecting users and service personnel from injury and the equipment from damage.

- ☐ Interlock Switch
  The interlock switch opens to interrupt +24VDC and +5V-LD (Laser diode drive) from the power supply circuit (HPS) to the controller circuit (C258MAIN) when the Cover Assy. Exit is open.









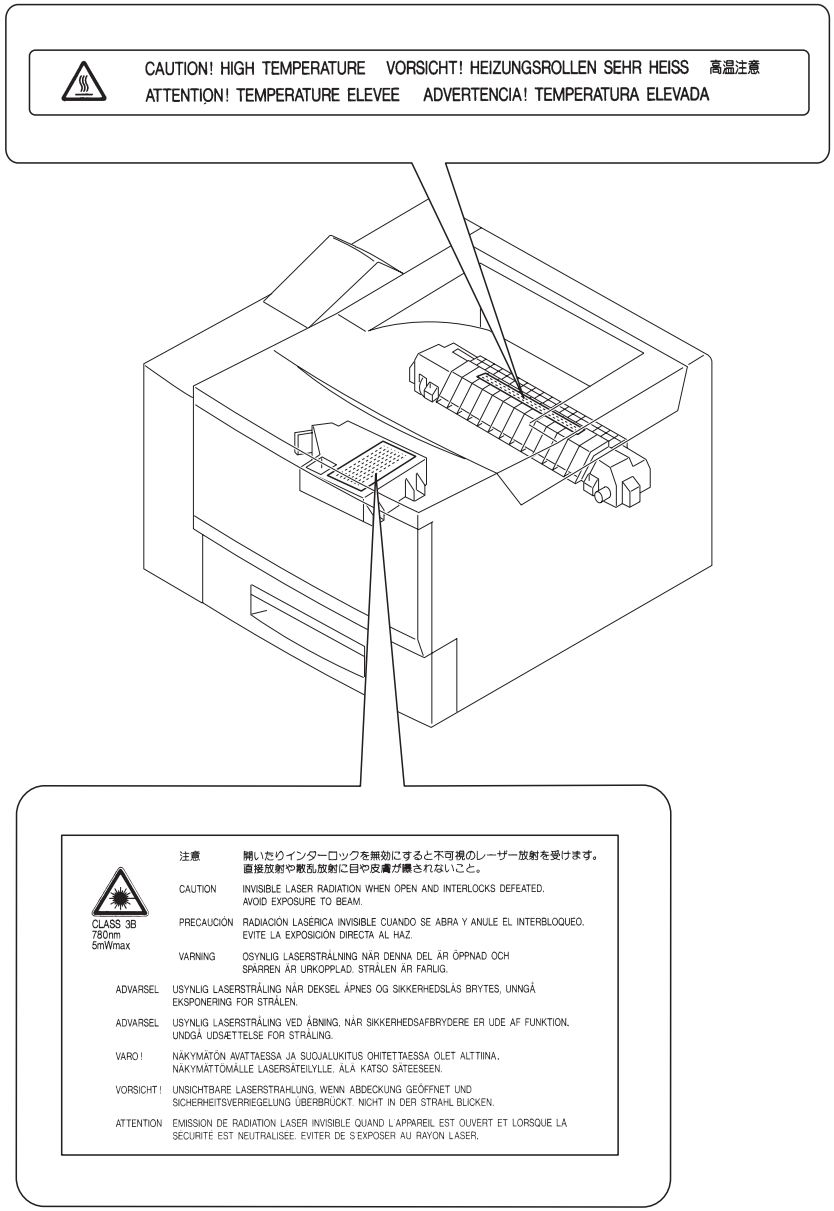
Warning/Caution Labels

WARNING and CAUTION labels are stuck on dangerous parts in the printer to make you aware of the potential dangers that are present when you are working with those parts.

ROS ASSY.

The laser beam used in this printer is invisible and it has a narrower frequency band and more coherent phases than any other light (sunlight, electric light). It has excellent monochromaticity and convergence. A thin laser beam reaches long distances. Because of its convergence characteristic, the laser beam converges into one point, causing high density and high temperature. A laser beam is harmful to the human body.

- **Do not expose yourself to the laser beam to prevent injury (blindness).**
- **Do not open the cover that has the laser beam warning label.**
- **If you disassemble or assemble the printer, turn off the power.**
- **If you need to work on the printer with power applied, strictly follow the instructions in this manual.**
- **Understand how the laser beam functions and take maximum precautions not to injure yourself or anyone around you.**

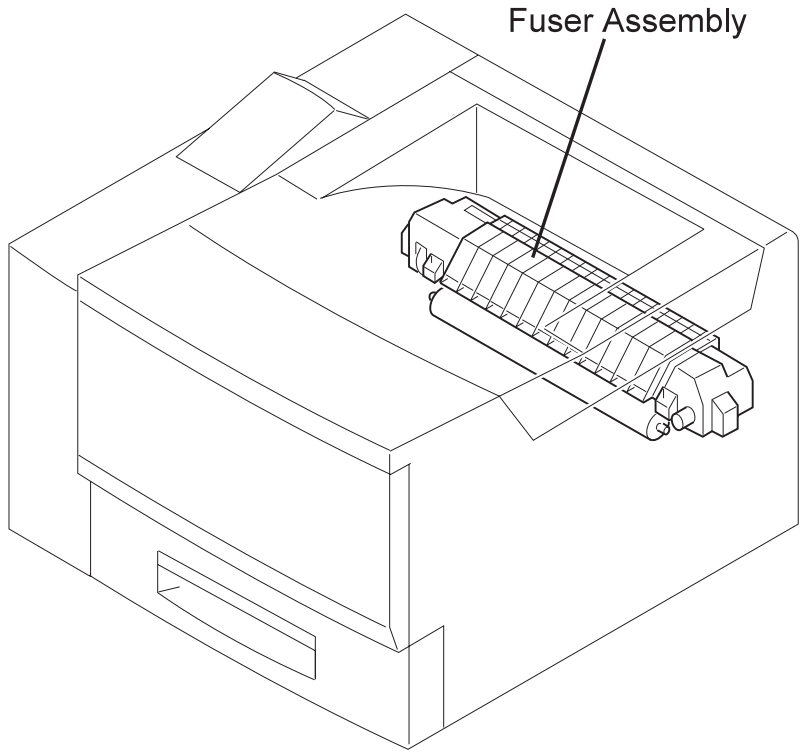

CAUTION! HIGH TEMPERATURE VORSICHT! HEIZUNGSROLLEN SEHR HEISS 高温注意
ATTENTION! TEMPERATURE ELEVEE ADVERTENCIA! TEMPERATURA ELEVADA
CLASS 3B
780nm
5mWmax
注意 開いたりインターロックを無効にすると不可視のレーザー放射を受けます。直接放射や散乱放射に目や皮膚が曝されないこと。
CAUTION INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
PRECAUCIÓN RADIACIÓN LASÉRICA INVISIBLE CUANDO SE ABRA Y ANULE EL INTERBLOQUEO. EVITE LA EXPOSICIÓN DIRECTA AL HAZ.
VARNING OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. STRÅLEN ÄR FÄRLIG.
ADVARSEL USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES, UNNGÅ EKSPONERING FOR STRÅLEN.
ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO! NÄKYMÄTÖN AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA. NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VORSICHT! UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT IN DER STRAHL BLICKEN.
ATTENTION EMISSION DE RADIATION LASER INVISIBLE QUAND L'APPAREIL EST OUVERT ET LORSQUE LA SECURITE EST NEUTRALISEE. EVITER DE S'EXPOSER AU RAYON LASER.

FUSER ASSY.

To prevent you from becoming injured or burned, do the following before working with a high temperature Assembly (e.g., Fuser Assembly):

- ☐ turn off the printer.
- ☐ Unplug the power cord.
- ☐ Wait until it cools down.

The high temperature Assembly is very hot immediately after any printer operations. Wait at least 40 minutes before you start working on the printer.



General Cautions

- ☐ Some materials (e.g., Developer or Fuser Oil) may cause bodily injury. Do not swallow or inhale these materials or allow them to come in contact with the eyes.
- ☐ Help to protect those around you and follow the prohibitions against swallowing or inhaling those materials. Be careful to protect the eyes at all times.
- ☐ Place a sheet under the printer so that the floor or workbench is protected.

Revision Status

Revision	Issued Date	Description
Rev. 0	August 17, 1998	Preliminary release. (intended for service training purpose only)
Rev. A	October 30, 1998	First issue.

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 OVERVIEW

The EPL-N1600 is the latest in EPSON's advanced lines of laser printers and offering the following features.

- ☐ High-speed printing
  Prints 16 pages per minute on A4 paper.
- ☐ High resolution
  Prints at 600dpi, with further enhancement provided by RITech (Resolution Improvement Technology) and Enh. MG (Enhance MicroGray).
- ☐ Rapid processing of print data
  The printer is equipped with a 150MHz RISC-CPU (VR4310) for faster data processing.
- ☐ Host can monitor printer status (by bidirectional interface)
  Supports IEEE-1284 nibble and ECP modes in Windows 95/98.
- ☐ High-capacity paper sources
  The printer comes standards with a 80-sheet MP tray and a 250-sheet universal cassette. (Maximum total load is 830 sheets with optional lower paper cassette unit.)

1.1.1 CONSUMABLES AND OPTIONS

The following table lists the EPL-N1600's consumables and supported options.

Table 1-1. Consumables and Options

Item	Code	Note
Imaging Cartridge	S051056	Life: 8500 pages
500 Sheet Lower Paper Cassette Unit (Universal)	C81290*	Supported paper size: A4, Letter, Legal, B5, Executive
Face Up Tray	C81294*	Eject capacity: 40 sheets
Duplex Unit	C81293*	Supported paper size: A4, Letter, Legal
Ethernet Card	C82357* C82362* C82363* C82364*	Type-B Optional I/F Card
32KB Serial Interface Card	C82307*	
32KB Parallel Interface Card	C82310*	
Coax Interface Card	C82314*	
Twinax Interface Card	C82315*	
GPIB Interface Card	C82313*	
AppleTalk Interface Card	C82312*	Use with EPSONScript Level 2 package (C83229*)
EPSONScript Level 2 Package	C83229*	• Emulates PostScript Level2 • ROM module

*: The asterisk (*) is a substitute for the last digit of the product code, which varies by country.

1.2 SPECIFICATIONS

This section describes the basic specifications of the EPL-N1600.

1.2.1 ENGINE SPECIFICATIONS

Printing method: Electro-photographic printing, utilizing semiconductor laser beam scan and single-component magnetic toner

Resolution: 600DPI

Printing speed:
<From Standard cassette>
15.7 PPM (A4)
16.6 PPM (Letter)
<From MP Tray>
11.3 PPM (A4)
11.7 PPM (Letter)
<From Lower Paper Cassette Unit>
15.2 PPM (A4)
16.0 PPM (Letter)

Time to print first sheet:
<From standard cassette>
14.4 sec (A4)
14.2 sec (Letter)
<From <MP Tray>
13.3 sec (A4)
13.1 sec (Letter)
<From Lower Paper Cassette Unit>
15.5 sec (A4)
15.3 sec (Letter)

Warm-up time: Within 45 seconds
(at 22°C / 55% RH / rated voltage)

Paper Supply:
<Standard>
Multi Purpose (MP) Feed Tray
(Capacity: 80 sheets)
Universal Lower Paper Cassette
(Capacity: 250 sheets)
<Optional>
500-sheets Lower Paper Cassette Unit
(Capacity: 500 sheets)

Table 1-2. Paper Supply / Paper Size / Capacity

Paper Supply	Capacity	Paper Size	Paper Thickness
MP Tray	80 sheets *1	• Standard size paper 90 x 148 - 215.9 x 355.6mm (A4, JIS-B5, A5, Letter, G-Letter, Executive, Legal, G-Legal, F4, Half-Letter) • Custom size paper Any size of paper within the range of 90 x 148 - 215.9 x 355.6mm	Normal paper: 60 - 105g/m² (16 - 28lb)
	10 sheets	Envelopes (Monarch, C10, DL, C5, C6, International-B5)	Special paper: 190g/m² Normal paper: 60 - 105g/m² (16 - 28lb)
	40 sheets	Labels / OHP sheet	Special paper
Standard Paper Cassette *2	250 sheets *1	A4, Letter, G-Legal, Legal, JIS-B5	Normal paper: 60 - 105g/m² (16 - 28lb)
Lower Paper Cassette Unit *2	500 sheets *1	A4, Letter, G-Legal, Legal	Normal paper: 60 - 105g/m² (16 - 28lb)

*1: With 20lb (70g/m²) paper.

*2: Universal cassette.

1.2.2 PAPER SPECIFICATIONS

Paper sources and size : As shown in the table below.

Table 1-3. Supported Paper and Supply Source

Type	Size mm (inch)	MP Tray	STD CST *1	Lower CST *2	Duplex *3
A4	210 x 297	Yes	Yes	Yes	Yes
A5	148 x 210	Yes	No	No	No
JIS-B5	182 x 257	Yes	Yes	No	No
LT	215.9 x 279.4 (8.5 x 11")	Yes	Yes	Yes	Yes
HLT	139.7 x 215.9 (5.5 x 8.5")	Yes	No	No	No
LGL	215.9 x 355.6 (8.5 x 14")	Yes	Yes	Yes	Yes
EXE	184.15 x 266.7 (7.25 x 10.5")	Yes	Yes	No	No
GLG	215.9 x 330.2 (8.5 x 13")	Yes	Yes	Yes	Yes
GLT	203.2 x 266.7 (8 x 10.5")	Yes	No	No	No
F4	210 x 360	Yes	No	No	No
MON	98.43 x 190.5 (37/8 x 7½")	Yes	No	No	No
C10	104.78 x 241.3 (41/8 x 9½")	Yes	No	No	No
DL	110 x 220	Yes	No	No	No
C5	162 x 229	Yes	No	No	No
C6	114 x 162	Yes	No	No	No
I-B5	176 x 250	Yes	No	No	No
16MO	198 x 275	Yes	No	No	No

*1: Universal Lower Paper Cassette

*2: Optional 500-sheets lower paper cassette unit

*3: Duplex printing is available only with a sheet fed from the cassette unit (standard or optional).

Supported paper sizes: Width= 90 to 216 mm (3.5 to 8.5 ")
Length=148 to 355.6mm (5.8 to 14 ")

Paper feed alignmnent: Left alignmnent for all paper size

Guaranteed print area: Entire paper area, excluding 4.0 mm from each edge of the paper.

NOTE: *In case of duplex printing, the printable area is limited to 6.0 mm from the bottom edge.*

Supported paper types: <Standard paper>
Xerox 4024 DP Paper 20lb (75 g/m²)
<Plain paper>
Weight=60 to 150 g/m² (16 to 28 lbs)
Standard copy paper, recycled paper

<Special paper>
Label sheets
Transparency film (for laser printer)
Colored paper
Thick paper (105 to 157 g/m²)
DTP paper
Letter head

NOTE: *Before purchasing paper in large quantities, check that sheets are fed correctly.*
Special paper, such as thick paper must be fed from the paper tray (do not feed from cassettes).

Prohibited paper types: The following paper types should never be used. Attempts to feed these paper types may result in inferior print quality, paper jams, and damage to the printer.

*Carbon paper, "non-carbon" paper
*Thermal paper, pressure-sensitive paper
*Acidic paper
*Inkjet-dedicated paper
*Paper or postcard already printed on by thermal-transfer printer or inkjet printer
*Thin or thick paper (exceeding the specification)
*Damp paper
*Paper with coated or processed color surface
*Paper with extra smooth or extra rough surface
*Paper whose rear side has very inconsistent smoothness
*Perforated paper
*Folded, curled, or torn paper
*Paper of irregular shape
*Paper cut at off-angle
*Label sheets that peel too easily
*Paper with clips, staples, glue, etc.
*Transparency film designed for color copy or page printer

Paper Ejection: Face-down or Face-up (option)

Ejection capacity: <Face-down>
250 sheets (Xerox 4024 paper (75 g/m²))
<Face-up> (with optional face-up tray)
40 sheets (Xerox 4024 paper (75 g/m²))

1.2.3 CONTROLLER SPECIFICATIONS

CPU: RISC-CPU (VR4300 / 150MHz)

RAM: <Standard> 8MB EDO RAM
<Optional> 1 EDO-RAM SIMM slot
(Accepts 4MB to 32MB EDO-RAM SIMM)
Maximum memory is 40MB

ROM: Font: 2MB (on-board)
Program: 4MB (on ROM-DIMM module)
(Installed in ROM-DIMM socket)

Expansion ROM: 2 ROM-DIMM slots (A/B slots)
A slot=For C83229* (EPSONScript) module
B slot=For local-font ROM module only

Interfaces: <Standard>
*Bidirectional parallel I/F (B type connector)
(IEEE-1284 compliant / Compatibility, Nibble and ECP mode)
*RS-232C serial I/F (D-SUB 25pin)

<Optional>
*Type-B interface slot (1 slot)

Control Panel: *8 push-button switches and 6 LED lamps.
*LCD Panel (1-line 20-column)

Software: *PCL5e emulation mode
*FX, ESC/P2, I239X emulation mode
*ESC/Page mode
*GL/2 mode

Other Feature: Built-in engine controller

1.2.4 ELECTRICAL SPECIFICATIONS

Power Requirements: See table below.

Table 1-4. Power Supply Specification

Item	100V Model	200V Model
Input Voltage	120V ±10% (90 to 132V)	220 - 240V ±10% (198 to 264V)
Rated Frequency	50 - 60Hz ±3Hz	50 - 60Hz ±3Hz
Rated Current	6.5A	3.5A
Power Consumption	• Maximum: 700W • Continuous printing: 350W • Stand-by (Heater ON): 70W • Stand-by (Heater OFF): 30W	

AC Line Noise: Pulse width= 50 to 1000 ns
Pulse polarity=+ / -
Repetition= Asynchronous
Modes= Common / Normal
Voltage= 1KV
(Parts must be able to withstand 2KV without damage)

Transient Outage: DIP 100% (at rated voltage - 10%) 1 cycle

Electrostatic Tolerance: <upto 10KV>
No hard error, no user-nonrecoverable software error
<upto 15KV>
No damage to parts

Surge Current: 1/2-cycle / Not above 50A

Insulation Resistance: 10Mohm or more

Dielectric Strength: Insulation shall not break down when the following voltage is applied between primary circuit and chassis for 1 minute:
*100V model: AC1000V
*200V model: AC1500V

Leakage Current: 3.5mA or less

1.2.5 CONSUMABLES

This printer's only consumable part is the Imaging Cartridge.

Table 1-5. Imaging Cartridge

Name	Components	Life	Weight
Imaging Cartridge S051056	• Development unit • Toner • OPC Drum • Charging Roller • Waste Toner Box • Cleaner Blade	Average: 8500 pages *	Approx. 1.3Kg

*: Toner life is estimated based on continuous printing on A4 size paper with 5% print coverage. Toner life will vary according to print coverage and printing method (continuous or intermittent, print density, toner-save mode, etc.).

1.2.6 OTHER SPECIFICATIONS

Printer life: 300,000 sheets or 5 years in use

Noise: Stand-by: Approx. 32.0dB(A)
Operating: Approx. 50.0dB(A)

Ozone Density: Less than 0.02 ppm

Toxicity: OPC, toner, and plastic materials are all nontoxic.

1.2.7 ENVIRONMENTAL SPECIFICATIONS

MAIN UNIT AND CONSUMABLES

Temperature and humidity: See table below.
(The conditions below are applicable for both the main unit and consumables.)

Table 1-6. Environmental Conditions - Main Unit

Item			Conditions
Temperature	Normal		0 to 35°C
	Extreme (within 1 month)	High temperature	35 to 40°C
		Low temperature	-20 to 0°C
Humidity	Normal		20 to 80%RH
	Extreme (within 1 month)	High humidity	80 to 95%RH
		Low humidity	10 to 20%RH
Storage			Within 24 months from the production

Air Pressure (Altitude): 460 to 760hPa (Max. 2500 meters)

Drop Tolerance: No damage when tested in accordance with JIS Z0200-1987 level 1
Direction=1 corner, 6 sides, 3 edge

Vibration Tolerance: Vibration= 5 to 100Hz / 100 to 5Hz
Acceleration= 0.7G
Sweep time= 10 minutes (one way)
Direction= Three directions (X/Y/Z)
Time= 50 minutes in each direction

CONSUMABLES

Table 1-7. Environmental Conditions - Consumables

Item			Conditions
Temperature	Normal		0 to 35°C
	Extreme (within 1 month)	High temperature	35 to 40°C
		Low temperature	-20 to 0°C
Humidity	Normal		20 to 80%RH
	Extreme (within 1 month)	High humidity	80 to 95%RH
		Low humidity	10 to 20%RH
Air Pressure			460 to 760hPa
Storage			Within 24 months from the production

1.2.8 OPERATING CONDITIONS

Temperature:	10 to 32°C
Humidity:	20 to 80%RH (without condensation)
Air Pressure (Altitude):	760hPa or more (below 2500m)
Tilt:	5° or less
Ambient Illumination:	3000 lux or less (Must avoid direct sunlight.)
Space Requirement:	To ensure proper operation of the printer, sufficient open space must be left around printer, as indicated in the illustration below.

- ☐ At least 400mm free space must be left at top of printer to allow for opening of the cover and replacement of the Imaging Cartridge.
- ☐ Remember that the printer becomes higher when a lower feed unit is installed. Maximum printer height (with large-capacity feeder installed) is 453mm.

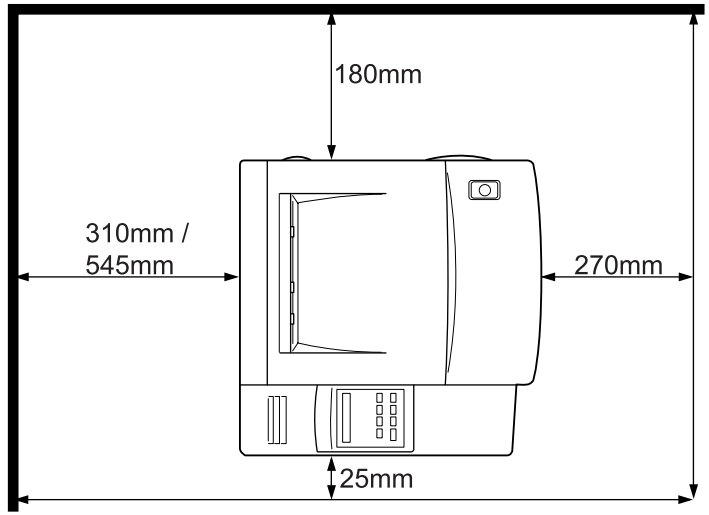

Figure 1-1. Space Requirement (1)

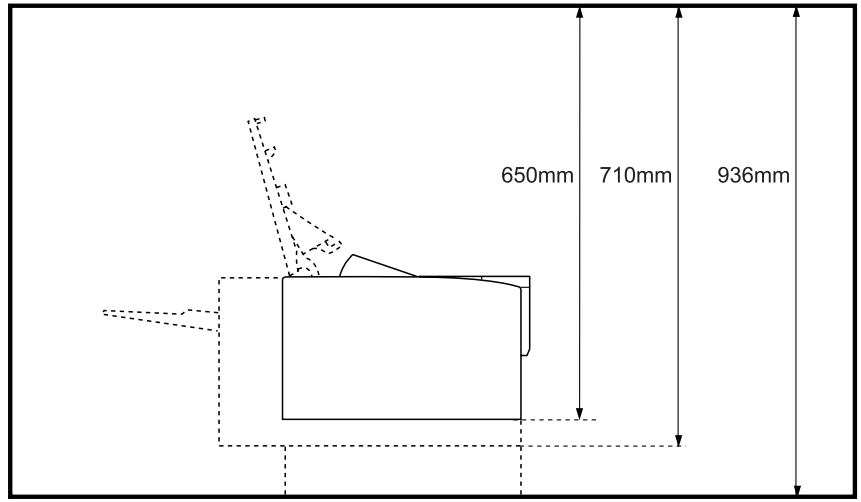

Figure 1-2. Space Requirement (2)

1.2.9 SAFETY APPROVAL

☐ Safety Regulation

Model	Applicable Standard
100V Model	• UL 1950 • CSA 22.2 No.950
200V Model	• TUV-GS (EN60950)

☐ Safety Regulation (Laser Radiation)

Model	Applicable Standard
100V Model	FDA (NCDRH) Class 1
200V Model	TUV-GS (EN60825)

☐ EMC

Model	Applicable Standard
100V Model	• CNS 13438 • CISPR22 (for Taiwan) • FCC Part15 Subpart B Class B / CSA C108.8 Class B
200V Model	• EC EMC directive 89/336/PEC EN55022 Class B EN61000-3-2 EN61000-3-3 EN50082-1 • AS 3548 (for Australia)

Power consumption: In compliance with International Energy Star program

Others:

<Toner>
No effect on human health.
(In compliance with OSHA, TSCA, EINECS, woker safety laws and CSCL)

<OPC>
No effect on human health.
(In compliance with OSHA)
<Ozone>
In compliance with UL478 5th Edition
<Materials>
In compliance with Swiss environment protection law (no CdS content)

1.2.10 RELIABILITY, DURABILITY AND MAINTENABILITY

MPBF: 120,000 sheets
(Average number of sheets printed between failures, where "failure" indicates a condition that requires part replacement or that cannot be corrected by user.)

Life: 300,000 sheets or 5 years in use
(whichever comes first)

MTTR: 30 minutes
(Average time to complete and confirm repair after ascertaining the site of the failure.)

Jam Rate: As indicated in the table below.

Table 1-8. Paper Feed Reliability

	Cassette		MP Tray	
	Single-side Print	Duplex Print	Single-side Print	Special Paper
Jam Rate	1/3000 or less	1/2000	1/600	1/100
Mis-feed rate	1/800 or less	-	1/300	1/25

*: Above figures are based on uncurled paper used immediately after removal from package.

*: The above figures include jams caused by misfeeds, multiple feeds, etc.

*: The above figures do no cover feeding at interface between paper stacks loaded at different times.

Print Start Position: Using standard paper from paper tray or cassette;
<Main scan direction>
Target position (c) ±2.5mm
<Subscan direction>
Target position (a) ±2.0mm

Skew: Using standard A4 paper from paper tray or cassette;

<Main scan direction>|c - d | ±2.0mm
<Sub scan direciton> | a - b | ±1.5mm

Ejection Curl: 20mm or less
(after 5 minutes from ejection)

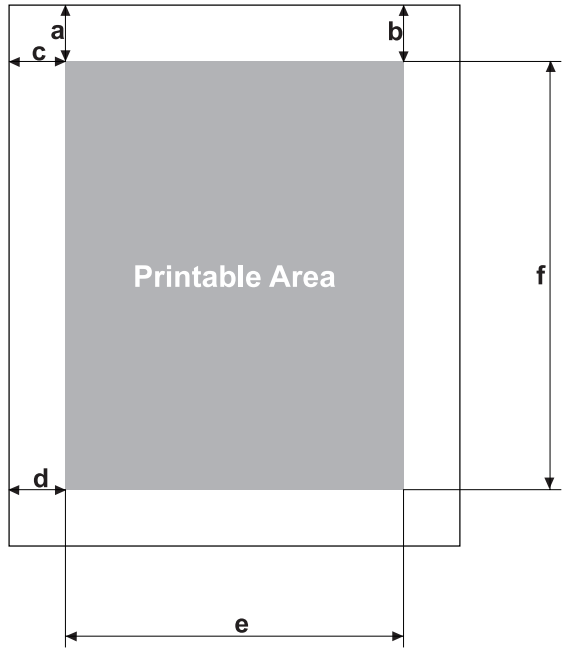

Figure 1-3. Printing Accuracy

1.2.11 EXTERNAL DIMENSIONS AND WEIGHT

Dimensions: See table below and illustration on right.

Table 1-9. Dimensions

Item	Width (mm)	Depth (mm)	Height (mm)
EPL-N1600(Main unit)	421	420	264
Lower Paper Cassette Unit (C812902)	396	389	114
(With main unit)	421	420	379
Duplex Unit (C812932)	396	517	254
(With main unit)	421	542	325
Full option	421	542	441

Weight: Approx. 13Kg
(excluding consumables and options)

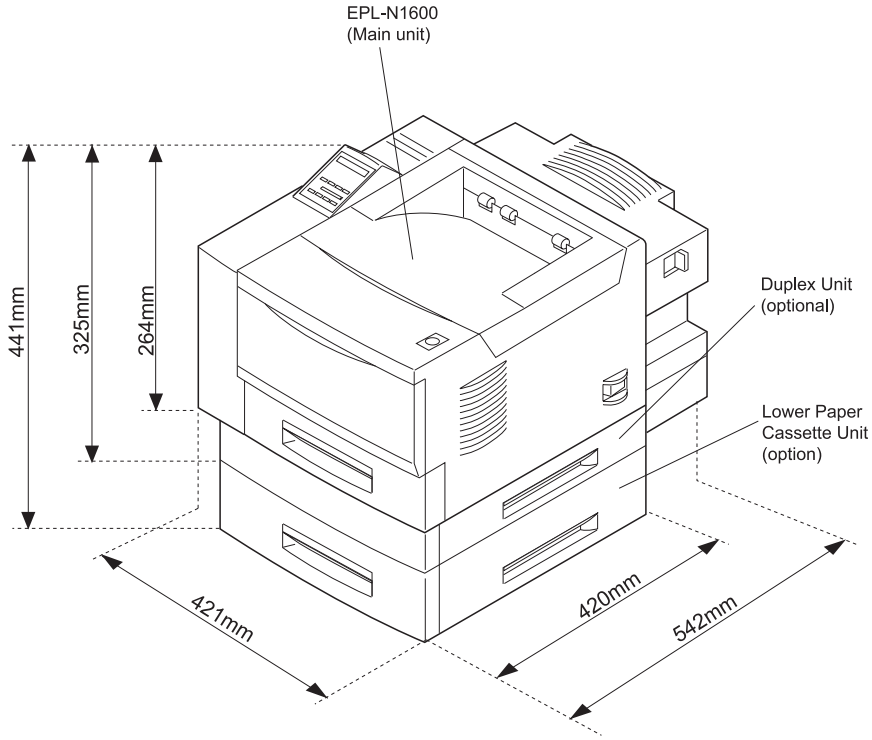

Figure 1-4. Dimensions

1.3 INTERFACE SPECIFICATIONS

The EPL-N1600 supports the following interfaces.

- ☐ Bidirectional parallel I/F (standard)
- ☐ RS-232C serial (standard)
- ☐ Type-B interface slot (1 slot for optional interface card)

1.3.1 Bidirectional Parallel Interface

The printer's built-in parallel interface complies with IEEE-1284, and supports Compatibility, Nibble and ECP modes.

Transmission: 8-bit parallel (IEEE-1284 compliant)

Synchronization: By externally supplied STROBE signal (STRBX)

Handshaking: By ACKX or BUSY

Logic Level: TTL level

Connector: IEEE-1284-B connector (36pin) (57RE-40360-830B(D7A) DDK or equivalent)

Mode: Compatibility, Nibble and ECP mode

Pin Assignment:: See the table on right.

Table 1-10. Bidirectional Parallel I/F Pin Assignment

Pin	I/O	IEEE 1284-B Connector		
	*1	Compatibility	Nibble	ECP
1	In	nStrobe	HostClk	
2-9	In/Out	DATA1 - 8		
10	Out	nACK	PtrClk	PeriphClk
11	Out	Busy	PrtBusy	PeriphAck
12	Out	PError	AckDataReq	nAckReverse
13	Out	Select	Xflag	
14	In	nAutoFd	HostBusy	HostAck
15	-	NC		
16	-	GND		
17	-	CG		
18	Out	PeripheralLogic High		
19-30	-	GND		
31	In	nInit		nReverseRequest
32	Out	nFault	nDataAvail	nPeriphRequest
33	-	GND		
34	-	NC		
35	Out	+5V		
36	In	nSelectin	IEEE1284 Active	

*1: "I/O" indicates a signal direction viewed from the printer.

1.3.2 Serial Interface

Type: RS-232C (conforms to EIA)

Transmission: Full duplex

Synchronization: Asynchronous

Transmission rates: 300 to 57600 bps

Parity bit: Even, Odd or NONE

Start bit: 1

Stop bit: 1 / 2

Data length: 7 or 8 bits

Protocols: •XON/XOFF control (software control)
(Robust mode is supported)
•DTR control (hardware control)

Connector: D-SUB 25pin
(17LE-13250-27(D57)

Pin Assignment: See the table on right.

Table 1-11. Serial I/F (RS-232C) Pin Assignment

Pin	Signal	I/O *1	Description
2	TXD	Out	Transmits data. This pin transmits serial data from the printer to the computer.
3	RXD	In	Received data. This pin transmits data from the computer to the printer.
5	CTS	In	Always ignored.
17		Out	Transmits data. This pin transmits serial data from the printer to the computer.
20	DTR	Out	Data terminal ready. This pin indicates whether or not the printer is ready to receive data. If the printer ready protocol is not selected, the printer is always ready to receive data (this pin is always HIGH). If the printer ready protocol is selected, the printer can accept data when the pin level is HIGH and cannot accept data when the pin level is LOW. When the DTR signal goes LOW, the host computer must stop sedning data within 256 characters. This function can be set on or off with the default-setting mode of the printer.
23			Received data. This pin transmits data from the computer to the printer.
24			Transmits data. This pin transmits serial data from the printer to the computer.
25		In	Received data. This pin transmits data from the computer to the printer.

*1: "I/O" indicates a signal direction viewed from the printer.

1.4 OPERATING SPECIFICATIONS

The control panel of the EPL-N1600 includes a variety of buttons and indicator lamps, together with an LCD. The user can use the panel to select the printer's operating mode, to set the various printer functions, and to view settings and status information.

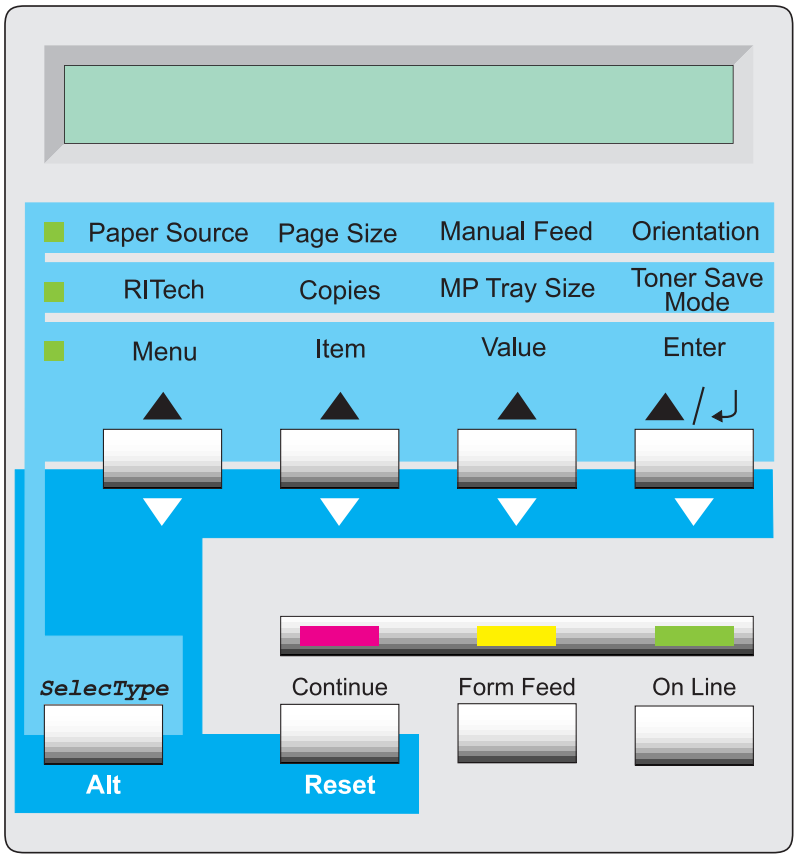

Figure 1-5. EPL-N1600 - Control Panel

LCD PANEL

1-line by 20 column LCD display equipped with backlight, and it is used for displaying printer status and setup menus

LED LAMPS

There are 6 LED lamps and a function of each one of these LED lamps are as below.

- ☐ On Line LED
  - ON: Printer is ready to receive data and print.
  - OFF: Printer is not for receiving print data.

- ☐ Form Feed LED
  - ON: Printer contains data that has not yet been processed. (If data is not effective print data, light will not be on.)
  - OFF: Printer has finished processing all print data. (If control code is not terminated, however, this lamp will be ON.)
  - Brinking: Printer is currently processing data.

- ☐ Continue LED
  - Brinking: Printer is in error state. User can clear the error by pressing the Clear Error button.

- ☐ One-Touch Mode 1 / 2 LED
  Indicate that panel is either in One-Touch mode 1.or One-Touch mode 2.

- ☐ SelecType
  Indicates that printer is in SelecType setting mode.

BUTTONS

- OnLine button
  Toggles printer ONLINE state on and off. (If printer is in one of the setup modes, this switch releases the mode and sets the printer to ONLINE state.)

- Form Feed button
  If the printer contains data but is not enabled for printing (if Form Feed lamp is on), this switch causes printer to output printing results and eject the paper. (This button does not cause ejection if Form Feed lamp is off.)

- Continue button
  Clears error (if pressed while Continue LED is blinking). When printer is in ONLINE state, this button will also clear any warning display that may appear on the LCD.

- SelecType / ALT button
  Selects the panel setting mode: OneTouch Mode 1, OneTouch Mode 2, or SelecType Mode. Also operates as a ALT key. Panel button operations vary according to the currently selected panel setting mode.

- MENU button
  Selects the corresponding OneTouch mode setting listed above this button, or selects the SelecType menu if in SelecType mode. Press this button whe the printer is online to enter SelecType mode.

- ITEM button
  Selects the corresponding OneTouch mode option listed above this button, or selects the fucntion available within the current menu, after entering the SelecType mode.

- VALUE button
  Selects the corresponding OneTouch mode option listed above this button, or selects the parameter available within the current item, after entering the Item of the SelecType mode.

- ENTER button / Status Sheet print
  Selects the corresponding OneTouch mode option listed above this button, or accepts the setting curretnly shown on the LCD as a new setting when in SelecType mode.
  Press this button twice when the printer is online to print the status sheet.

- RESET (ALT + Conitnue)
  Pressing the Continue button while holding down the ALT button will reset the printer. The LCD will display the message RESET. To generate a complete reset (warm boot), continue to hold down these buttons for approximately five seconds after the RESET message appears; the message will then change to RESET ALL and the printer will start warm-up processing.

1.4.1 Panel Settings

This section explains the printer's three panel-setting modes.

1.4.1.1 OneTouch Mode

The printer offers two quick-set modes: OneTouch mode 1 and OneTouch mode 2. You can select either of these modes by pressing the SelecType button as necessary. The following table shows the settings that can be made from each of these modes.

Table 1-12. OneTouch Mode Menu

Button	OneTouch Mode 1	OneTouch Mode 2
MENU	Paper Source (Selects source for paper feed)	RITech (On / Off)
ITEM	Paper Size (Use to display or select the paper size)	Copies (Selects number of copies to be printed.)
VALUE	Manual Feed	MP Tray Size (Selects size of paper in MP tray.)
ENTER	Orientation (Selects vertical or horizontal image direction.)	Toner-Save Mode (Sets Toner-Save mode ON or OFF.)

1.4.1.2 SelecType Mode

SeleType mode presents a variety of menus. Table below shows the mode's switch operations and available settings.

Table 1-13. SelecType Mode Menu

MENU Button	ITEM Button	VALUE Button
Test Menu	Status Sheet LJ4 Font Sample ESCP2 Font Sample FX Font Sample I239X Font Sample PS Status Sheet*1 PS Font Sample*1 PS Fact Sheet*1	
Emulation Menu	Parallel / Serial / AUX*2	Auto / LJ4 / ESCP2 / FX / I239X / PS*1 / GL2
Printing Menu	Paper Source Page Size Wide A4 Orientation Copies Manual Feed Resolution Skip Blank Page Duplex*5 Binding*5 Start Page*5	Auto / MP / LC1 / LC2*3 A4 *4 / A5 / / B5 / LT / HLT / LGL / GLT / GLG / EXE / F4 / MON / C10 / DL / C5 / C6 / IB5 / CTM OFF / ON Port / Land 1 - 999 OFF / ON 600 / 300 OFF / ON*6 OFF / ON Long Edge / Short Edge Front / Back
Tray Size Menu	MP Tray Size*7 LC1 Size*8 LC2 SIze*3	A4 *4 / A5 / / B5 / LT / HLT / LGL / GLT / GLG / EXE / F4 / MON / C10 / DL / C5 / C6 / IB5 / CTM A4 / LT / LGL / GLG / B5 / EXE A4 / LT / LGL / GLG

MENU Button	ITEM Button	VALUE Button
Config Menu	RITech	ON / OFF
	Toner Save	OFF / ON
	Density	1 / 2 / 3 / 4 / 5
	Top Offset	-9.0 - 0.0 - 99.0 (step: 0.5mm)
	Left Offset	-9.0 - 0.0 - 99.0 (step: 0.5mm)
	Size Ignore	OFF / ON
	Auto Cont	OFF / ON
	Page Protect	Auto / ON
	Image Optimum	Auto / OFF / ON
Setup Menu	Interface	Auto / Parallel / Serial / AUX*2
	Time Out	0, 5 - 60 - 300
	Standby*24	Enable / Disable
	Lang	English / Français / Deutsch / ITALIANO / ESPANOL / SVENSKA / Dansk / Nerderl. / SUOMI / Português
	Printer Name	OFF / ON
	Toner	E****F
	Toner Counter Clear	
	MP Init. Paper*12	100% / 75% / 50% / 25%
	LC1 Init. Paper*12	100% / 75% / 50% / 25%
	LC2 Init. Paper*3 *12	100% / 75% / 50% / 25%
	Page Count	0 - 99999999
	SelecType Init	
Parallel Menu	Speed	Fast / Normal
	Bi-D	Nibble / ECP / OFF
	Buffer Size	Normal / Maximum / Minimum
Serial Menu	Word Length	8 / 7
	Baud Rate	9600 / 19200 / 38400 / 57600 / 300 / 600 / 1200 / 2400 / 4800
	Parity	None / Even / Odd
	Stop Bit	1 / 2
	DTR	ON / OFF
	Xon/Xoff	ON / OFF / Robust
	Buffer Size	Normal / Maximum / Minimum

MENU Button	ITEM Button	VALUE Button
AUX Menu*2	Buffer Size	Normal / Maximum / Minimum
LJ4 Menu	FontSorce	Resident / DIMM / Download
	Font Number	0 - available (max. 65535)
	Pitch*9	0.44 - 10.00 - 99.99 (step:0.1cpi)
	Height*9	4.00 - 12.00 - 999.75 (step:0.25pt)
	SymSet*10	IBM-US / Roman-8 / ECM94-1 / 8859-2 ISO / 8859-9 ISO / IBM-DM / PcMultiling / PcE.Europe / PcTk437 WiAnsi / WiE.Europe / WiTurkish / DeskTop / PsText / VeInternati / VeUS / MsPublishin / Math-8 / PsMath / VeMath / PiFont / Legal / ANSI ASCII / Swedish2 / Italian / Spanish / German / Norweg1 / French2 / Windows
	Form	5 - 64*4 - 128
	Source Symset	0 - 277 - 3199
	Dest Symset	0 - 277 - 3199
GL/2 Menu	GL-Mode	GLlike / LJ4GL
	Scale	OFF / A0 / A1 / A2 / A3
	Origin	Corner / Center
	Pen	Pen0 / 1 / 2 - 6*11
	End	Butt / Square / Triangular / Round
	Join	Mitered / Miteredveveled / Triangular / Round / Beveled / None
	Pen0/1/2 - 6*11	0.05 - 0.35 - 5.00 (step:0.05mm)

MENU Button	ITEM Button	VALUE Button
PS Menu*1	Err Sheet	OFF / ON
	MicroGray	ON / OFF
	Protect Level	1 - 5
ESCP2 Menu FX Menu	Font	Courier / Prestige / Roman / Sans serif / Roman T / Orator S / Sans H / Script / OCR A / OCR B
	Pitch	10cpi / 12cpi / 15cpi / Prop.
	Condensed	OFF / ON
	T.Margin	0.40 - 0.5 - 1.50 (step:0.05")
	Text	1 - 66*4 - available (max 81)
	CGTable	PcUSA / Italic / PcMultilin / PcPortugue / PcCanFrenc / PcNordic / PcTurkish2 / PcE.Europe BpBRASCII / BpAbicomp
	Country	USA / French / Germany / UK / Denmark / Sweden / Italy / Spain1 / Japan / Norway / Denmark2 / Spain2 / LatinAmeric / Korea / Legal
	Auto CR	ON / OFF
	Auto LF	OFF / ON
	Bit Image	Dark / Light / BarCode
	ZeroChar	0, 0 (slashed)
I239X Menu	Font	Courier / Prestige / Gothic / Orator / Script / Presentor / Sans serif
	Pitch	10cpi / 12cpi / 15cpi / 17cpi / 20cpi / 24cpi / Prop.
	Code Page	437 / 850 / 860 / 863 / 865
	T.Margin	0.30 - 0.40 - 1.50 (step:0.05")
	Text	1 - 67*4 - available (max 81)
	Auto CR	OFF / ON
	Auto LF	OFF / ON
	Alt. Graphic	OFF / ON
	Bit Image	Dark / Light
	ZeroChar	0, 0 (slashed)
	CharacterSet*4	1 / 2

NOTE:

**1: Can be selected only if an optional EPSONScript Level2 package (C83229*) is installed.*
**2: Can be selected only when an optional Type-B interface card is installed.*
**3: Can be selected only if the optional lower cassette unit (C812902) is installed.*
**4: Factory default varies depending on the destination.*
**5: Can be selected only if an optional Duplex unit (C812932) is installed.*
**6: Applicable only for LJ4 and ESC/Page mode.*
**7: Do not change automatically after printing.*
**8: Display only and cannot select the size.*
**9: Either "Pitch" or "Height" is displayed depending on the selected pitch: Fixed pitch="Height", Proportional pitch="Pitch"*
**10: Additional symbol sets will be displayed if an optional font ROM is installed.*
**11: Can be selected only in GL/Like mode.*
**12: "100%" capacity:MP=80 sheets, LC1=250 sheets, LC2=500sheets*

1.4.2 Printer Status Messages

The table below lists the printer status messages that are displayed on the LCD panel.

Table 1-14. Error Message

Message	Type
Service Req. effff *1	Service-call error
ROM check	Status
RAM check	
Self Test	
Reset All	
Reset	
Duplex Unit Fail	Error
Check Duplex P-Size	
Exiting Paper Jam	
Paper Jam	
Feed Jam	
Paper Jam in Duplex	
Jam in Duplex Tray	
Jam in Duplex Cover	
Insert Imaging Crtg	
Printer Open	
Duplex Cover Open	
Insert Duplex Tray	
Manual Feed xxx yyyy	
Insert LC1	
Paper Out sssss tttt	
Paper Set sssss ttttt	
Print Overrun	
Illegal Aux I?F Card	
Mem Overflow	
Duplex Mem Overflow	
Illegal DIMM A	
Write Error DIMM A	
Reset to Save	Status
Writing DIMM A	
Menus Locked (at panel setting operation)	Warning
Duplex print was off	
Face Up print off	
Check Paper Size	
Image Optimum	
Need Memory	
Format Error DIMM A	
Form Feed (during test prinitn)	Status
Warming Up	
Toner Low	Warning
Standby	Satus
Ready	

1: Refer to Chapter-3 Troubleshooting for detail.

The order of list is corresponding to a priority of message and the list starts from the high priority order.

1.4.3 Initialization Process

The following tables shows the process carried out for each of the printer's three initialization types.

Table 1-15. Initialization

Type	Trigger	Processing
Reset	Press "Continue" button while holding down "ALT" button	• Cancels all data processing and all completed print jobs. • Deletes all data stored in the receive buffer for the currently active interface. (Retains data for other interfaces.) • Clears error condition. Use this reset operation to cancel multiple-copy printing or to abort inappropriate printing.
Warm Boot	Press "Continue" button while holding down "ALT" button and hold them for specified period of time.	Terminates printing jobs and executes reset for all interfaces. The printer returns to its initial power-on state; but does not repeat power-on self tests • Initialize memory. • Clear receive buffers for all interfaces.
Cold Start	Executed at power-on. (Power-on initialization)	• Initialize engine. • Check ROM/ EEPROM and RAM. • Check peripheral devices. • Initialize memory. • Initialize peripheral devices.

For all three reset types, the printer will enter READY state upon normal termination of reset processing.

1.4.4 Special Functions

Built-in special fucntion can be selected by turning on the printer while holding down the specific combination of button(s). The table below explains each operation

CAUTION

All special functions (with the exception of hex dumps) are intended for service technicians only and are not documented in the user manual. Please handle these operations with due care.

Note that to activate the operation you must continue to hold the buttons down until the LCD indicates that "RAM check" is completed

Table 1-16. .Special Function

Mode/Operation	Buttons	Result
Hex-Dump Mode	Form Feed	Once this mode is activated, the printer prints a hex dump of all received codes and data. To cancel this mode, you must switch the printer off.
Initialize EEPROM*1	• Online • Continue • Menu	Clears all EEPROM content, then writes factory settings into EEPROM. (Also initializes total page count.)
Initialize panel settings*1	Continue	Resets all panel settings (common environment settings and interface-specific settings) to their factory defaults.
Clear total page count*1	• Online • Menu • Item	Clears the total page count to 0.
Force-erase the flash-ROM module*1	• ALT • Item • Value • Enter	Deletes content of flash ROM module in slot A.
Update program ROM*1	• Online • ALT • Value	Updates content of ROM-DIMM in program sockets.
Copy ROM module*1	• Online • ALT • Enter	Copies content of ROM module in slot B into ROM module in slot A.
Toner Counter Reset	• Online • Form Feed	Reset the toner counter value to "Full" status.
Maintenance Mode *1	• Online • Form Feed • Continue	The maintenance menu item is added to the setting menu.

*1: For details, refer to Chapter 4 "Disassembly and Reassembly"

1.4.5 OTHER SPECIFICATIONS

This section presents information related to product distribution and handling.

1.4.5.1 Jumper Settings

The main control circuit board of this printer (C258MAIN) includes four jumper switches. Set the switches in accordance with product destination, as follows.

Table 1-17. C258MAIN Jumper Settings

Jumper	Standard *1	Latin America	Russia
RJ1	Installed	Installed	Installed
RJ3	Not installed	Not installed	Not installed
RJ4	Not installed	Not installed	Not installed
RJ5	Installed	Not installed	Installed
RJ6	Not installed	Installed	Not installed
RJ7	Not installed	Not installed	Not installed
RJ8	Not installed	Not installed	Not installed
RJ9	Not installed	Not installed	Not installed
RJ10	Not installed	Not installed	Not installed
RJ11	Installed	Installed	Installed
RJ12	Not installed	Not installed	Not installed
RJ13	Installed	Installed	Installed
RJ14	Not installed	Not installed	Not installed
JP2	1 - 2 pin connected	1 - 2 pin connected	1 - 2 pin connected
JP3	Connected	Connected	Connected

NOTE: **1:Applicable for all destinations except for Latin America and Russia.*

1.4.5.2 Program-ROM Specifications

The printer's control program is provided on a ROM board which mounts into the ROM-DIMM slot on the main board. The printer will include one of the ROM boards indicated in the table below.

Table 1-18. Program ROM Specification

Name	No.	Specification
Board Subassembly	C215PROG	• Flash PROM • 8Mbit x 4 (IC 3/4/5/6)
Board Subassembly	C258PROG	• Mask ROM • 16Mbit x 2 (IC 1/2)

Specifically, the ROM board will be flash-type during initial mass production (so that it can be updated locally), but will be changed to mask-ROM type when production stabilizes.

- ☐ At start of mass production: C215PROG board
- ☐ When production becomes stable: C258PROG board

The C215PROG board (flash ROM) can be updated using the printer's "progarm-ROM update" feature. Refer to Chapter 5, "Adjustments," for more information.

1.4.5.3 RAM Capacity

If the printer does not have sufficient RAM capacity to complete normal printing, it will display one of the following two error messages.

- "Insufficient memory"
- "Mem Overflow"
- "Need Memory"

These messages indicates that the printer does not have enough memory to execute the specified printing. The problem can be resolved either by installing (or increasing) expansion RAM or by reducing the receive-buffer size.

1.4.5.4 Operating Precaution

The printer's control circuit board includes nonvolatile (EEPROM) memory that is used to store printer settings and control data. Switching off the power while the printer is writing to EEPROM may in some cases cause loss or corruption of EEPROM content, resulting in one of the following errors.

- At next power-on, the printer generates a service-call error.
- When user executes a warm boot ("full reset") from the control panel, the printer initializes the panel settings.

Accordingly, power should never be switched off while the printer is in any of the following states.

- When the LCD is displaying "Initializing Settings".
- When the On Line lamp is blinking.
- When printing operation is in progress (while motor is running).

CHAPTER

2

OPERATING PRINCIPLES

2.1 OVERVIEW

This chapter explains the functions and operating principles of engine mechanism and controller of the EPL-N1600.

2.1.1 Electrophotographic Printing

Like other EPSON page printers, the EPL-N1600 also using the electrophtographic prinitng system combined with a semi-conductor laser beam scanning system, as illustrated below.

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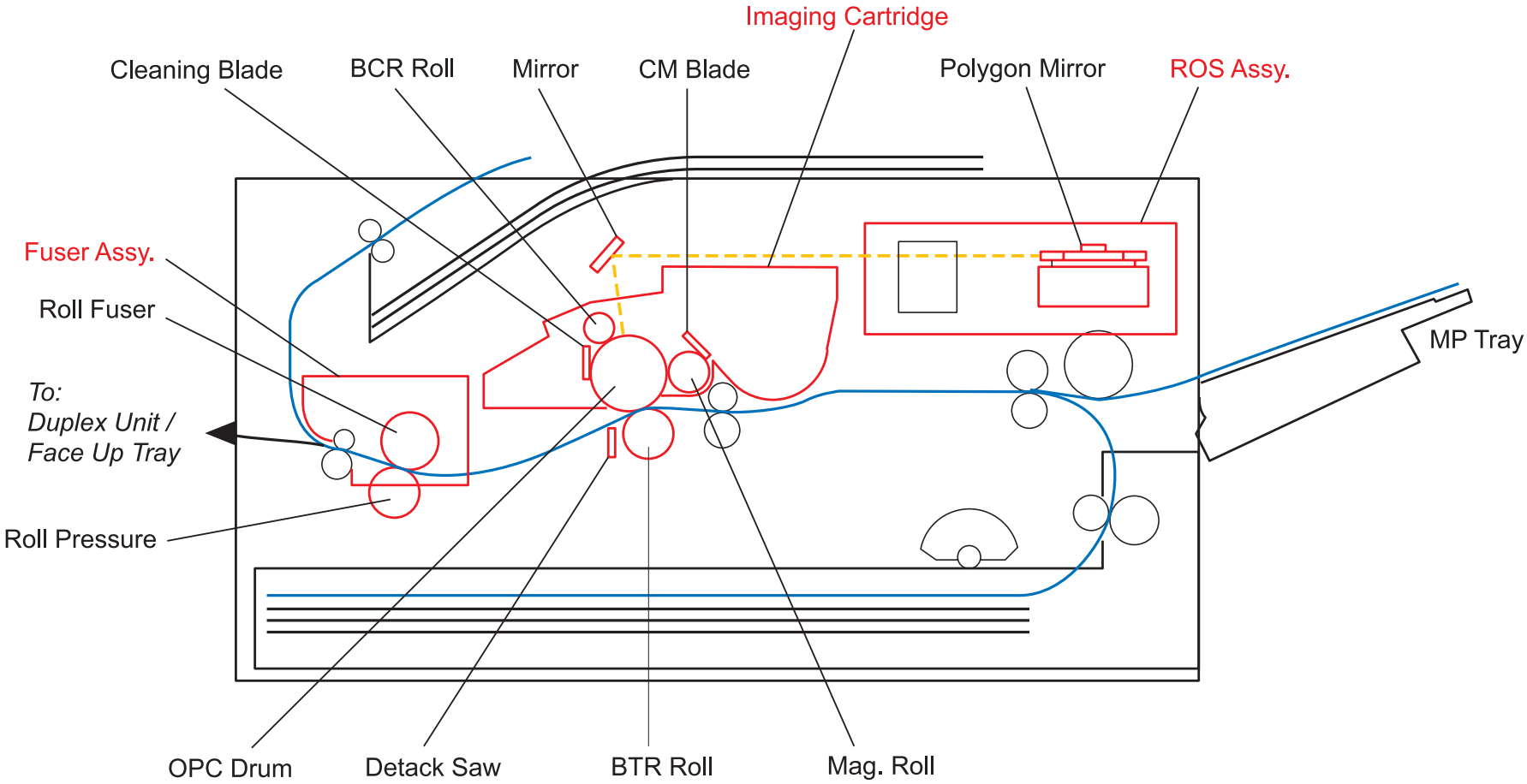


Figure 2-1. Electrophotographic Process Components

Table 2-1. Electrophotographic Printing Process

Step	Process	Explanation
1	Charging	In this process, electric discharge from the BCR (Bias Charge Roll) generates a uniform negative charge on the surface of the OPC (Organic Photconductor) drum located within the Imaging Cartridge.The BCR is a conductive roller positioned in contact with the OPC drum, The HVPS ASSY applies a bias voltage (a negative DC bias voltage superposed on an AC voltage) to the BCR. The AC voltage is controlled by constant-current regulation and the current level is apporx. 800µA (850Hz). This AC component evens out the residual charge left on the OPC drum during the previous print cycle, so that a uniform negative charge corresponding to the DC bias voltage level (approx. -400VDC) is generated over the entire drum surface.
2	Exposure	In this process, the ROS (Raster Output Scanner) ASSY generates the latent image onto the OPC drum surface by scanning the drum with the laser. The scanner motor rotates the polygon mirror within the ROS ASSY. The mirror reflects the laser beam produced by the laser diode so that the beam scans across the drum surface. The OPC drum surface consists of a photoconductive layer covering an aluminum (conductor) base. As the beam strikes the surface it generates electrons and holes within the photoconductive layer. The electrons are pulled by the electric field into the conductor base, while the holes move to the outside surface of the photocondutor layer (the outside of the drum), combining with the surface electrons and reducing the surface charge (increasing the potential). This action occurs only at the areas illuminated by the beam. The result is that the negative charge at the illuminated areas is lower than the negative charge at the non-illuminated areas. This charge differential constitutes the latent image. The SOS (Start of Scan) sensor attached at the side of MIRROR M1 detects the scan start position (by detecting the laser illumination at the scan start area).
3	Development	This process applies toner to the drum surface to generate the visible image. This printer utilizes non-conductive dry single-component magnetic toner. Toner adheres to a surface of the MAG ROLL by magnetic force, while the narrow gap between the CM (Charging and Metering) blade keeps this toner coating extremely thin and uniform. The friction between the CM blade and the MAG ROLL generates a negative charge on the toner. A negative DC voltage (approx. -315VDC) superposed on an AC voltage (approx. 1.8KVp-p at 3.0KHz) is applied to a thin semiconductive sleeve that covers the MAG ROLL, as a developing bias (DB). The DC component of the bias keeps the MAG ROLL at negative potential with respect to the OPC drum's conductive layer and the AC component of the development bias serves to facilitate the transfer of the toner on the MAG ROLL. As a consequence, the parts of the drum surface that were not hit by the laser beam (the areas where the negative charge was not reduced) will have lower potential than the MAG ROLL, while the parts that were hit by the laser beam will have higher potential. Because the toner on the MAG ROLL is negatively charged, it will transfer to the OPC drum only at those areas where the potential on the drum is higher than the potential on the MAG ROLL, thereby forming the visible image.
4	Transfer	This process transfers the visible image formed by a toner on the OPC drum surface, to the paper. This printer utilizes a BTR (Bias Transfer Roller) to effect the transfer. The BTR is a conductive roller that is in positioned in contact with the OPC drum. When the paper moves between the OPC drum and the BTR, the BTR applies an HVPS-generated positive charge (+700VDC) to the back side of the paper. This pulls the toner image off the drum surface and onto the paper.
5	Separation	In the separation process, the action of the negatively charged DETACH SAW neutralizes a positive charge remained on the paper which causes the paper to stick to the drum surface, so that the paper comes free of the drum. Specifically, an HVPS-generated negative voltage (-2.0KVDC) is applied to the DETACH SAW.
6	Fusing	This process fuses the toner image (the image transferred onto the paper in the transfer process) to the paper. This printer uses a HEAT ROLL to fuse the image to the paper. The HEAT ROLL is heated by an internal heater lamp. A PRESSURE ROLL is positioned in contact with the HEAT ROLL. When paper passes between the HEAT ROLL and PRESSURE ROLL, the application of heat and pressure fuses the toner to the paper.
7	Cleaning	In this process, a cleaning plate attached to the OPC drum scrapes residual toner (the toner that not transfered to the paper) off the drum surface. The toner scraped off from the drum surface is collected in the waste-toner compartment within the Imaging Cartridge. In addition to the above explained cleaning operation, the BTR surface is also cleaned electrically. At the initialization cycle of the printer operation or before starting a print job, a negative charge (approx. -600VDC) is applied to the BTR and the toner sticking on the BTR surface is transferred from the BTR to the drum by this voltage.

2.1.2 Paper Transportation

The illustration below is a cut-section view of the engine mechanism and it shows the paper path and the major engine components relating to the paper transportation.

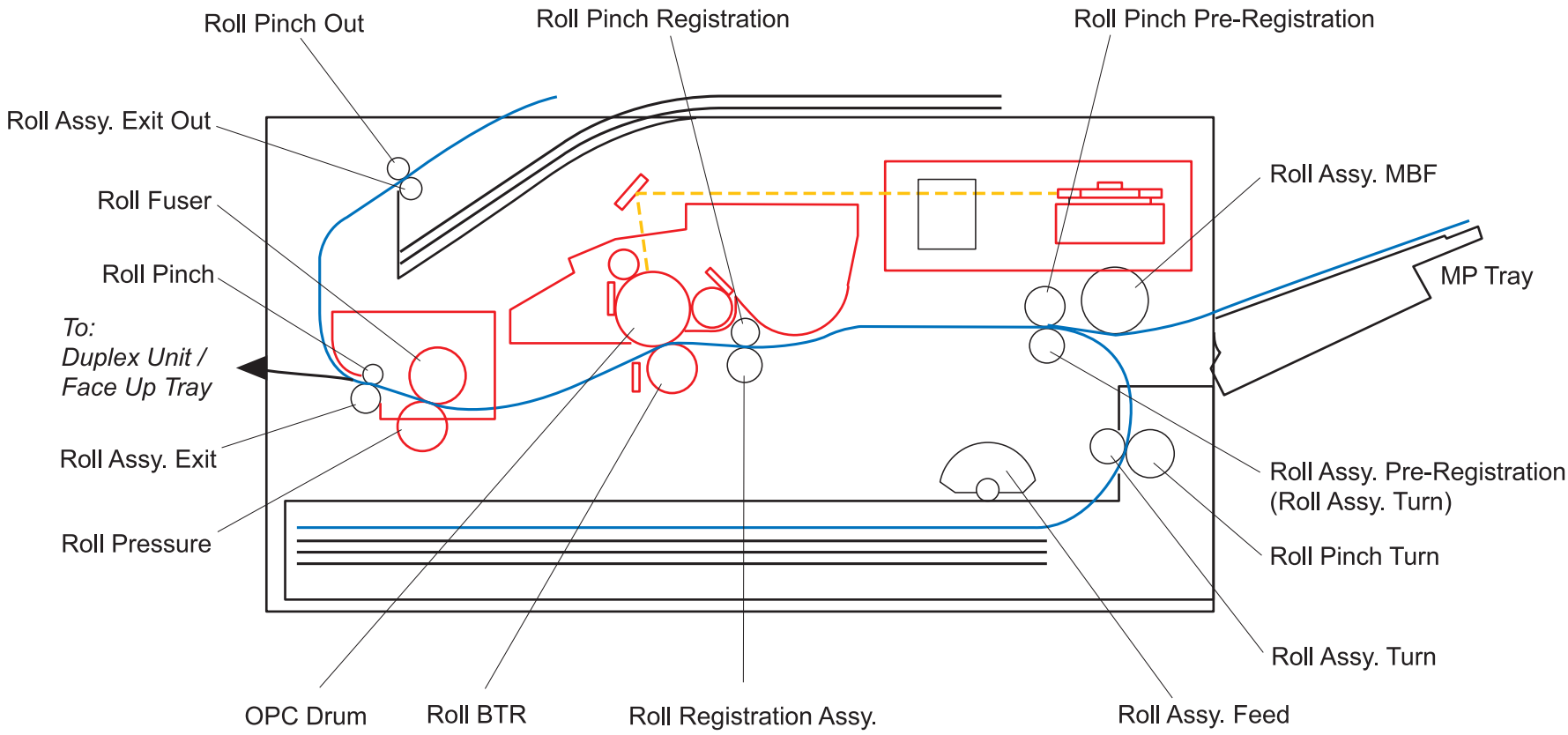
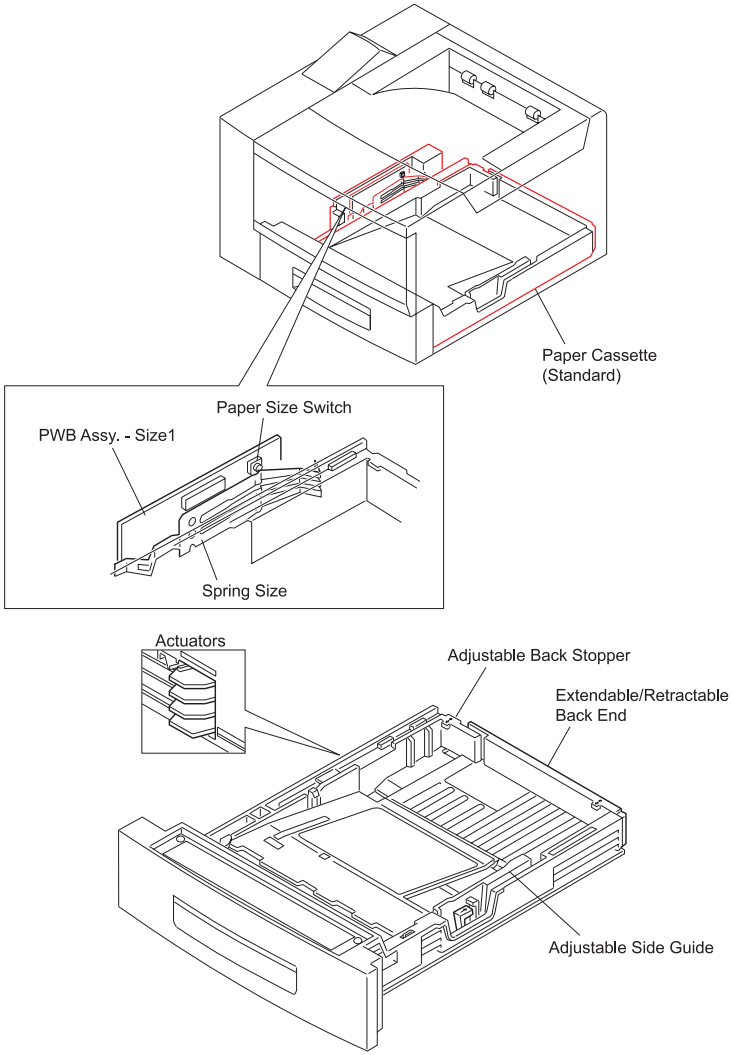


Figure 2-2. Engine Components for Paper Transportation

2.1.3 Main Engine Components Function

This section explains the structure and operation ofeach part of the engine mechanism.

PAPER CASSETTE (STANDARD)

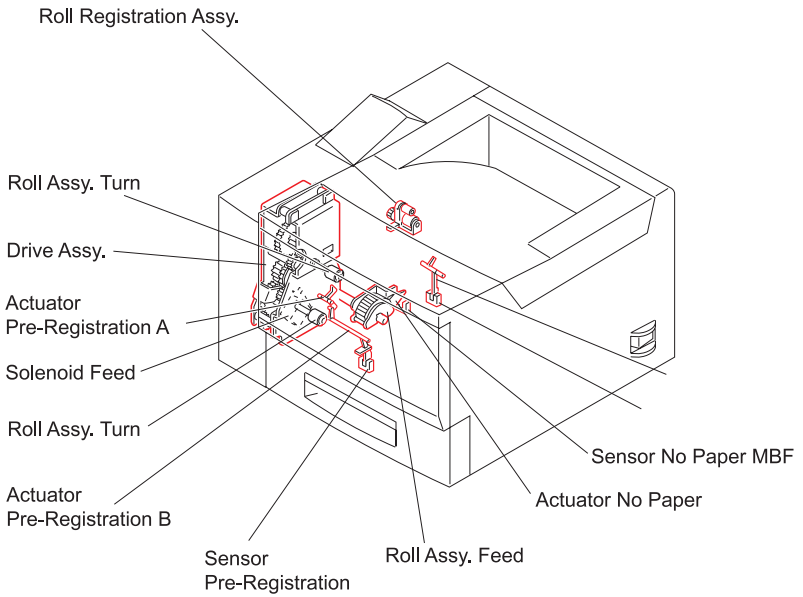


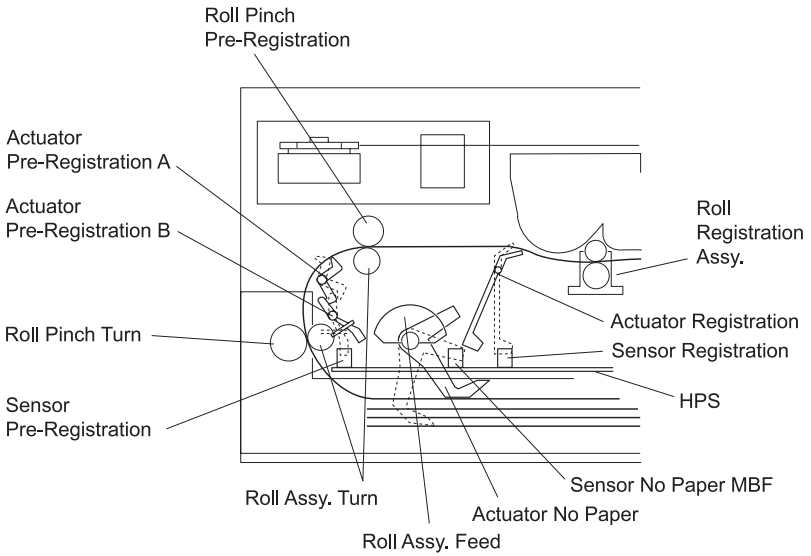
Paper Cassette: Universal paper cassette that can hold six regular sizes of plain paper cut sheets up to 250 sheets. Adjusting the Back Stopper makes the Actuators on the left side of the Cassette in a combination corresponding to the position of the Back Stopper. The Actuators press their corresponding prongs of the Spring Size, which in turn actuate the corresponding Paper Size Switches of the Sensor Assembly-Size 1.

PWB ASSY.-Size 1: The board has three Paper Size Switches 1 to 3. Each Switch is actuated by the corresponding prong of the Spring Size when the prong is pressed by the corresponding Actuator on the Paper Cassette. The pattern of actuated Switches identifies the size of the paper that is loaded in the Cassette. When the Cassette is not in place, all Switches are not actuated, and the printer can detect removal of the Cassette. Refer to Paper Size Detection in Section 13 for the relationship between paper sizes and patterns of actuated Paper Size Switches.

Spring Size: The Spring Size is pressed by the corresponding Actuators on the left side of the Paper Cassette, and the psring is then pressing the corresponding paper size switchs.

PAPER TRANSPORTATION I





Drive ASSY. : This unit distributes a drive that transmitted from the main motor, to Feed Rolls (Roll Assembly Feed and Roll Assembly MBF), Turn Rolls (Roll Assembly Turn), and also to the optional units

Solenoid Feed: Releases the drive gear of the Roll Assembly Feed to allow the gear to rotate when actuated and latches the gear when the gear rotates one turn.

Roll Assembly Feed: Rotates one turn each time the Solenoid Feed is actuated. The Roll Assembly Feed pushes one sheet of paper out of the Paper Cassette during each rotation.

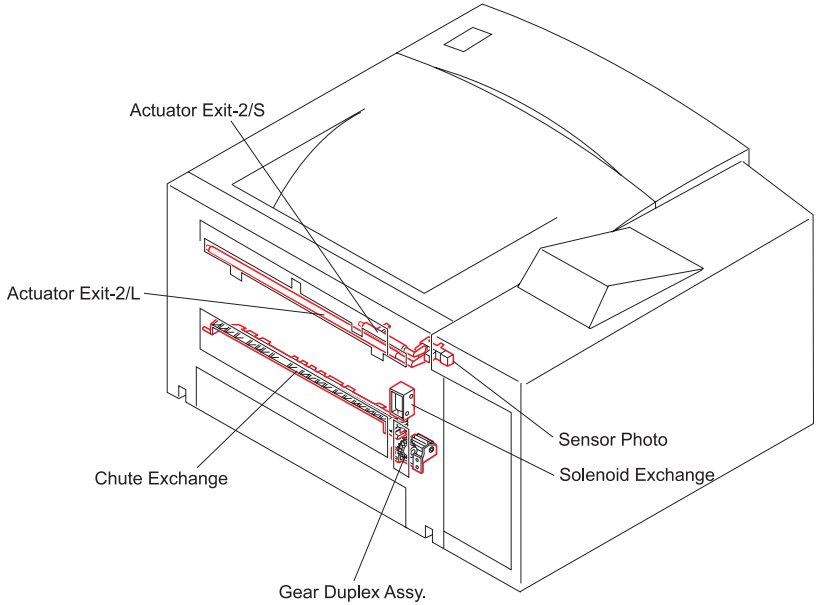
Rolls Assembly Turn: Drives paper fed into the printer.

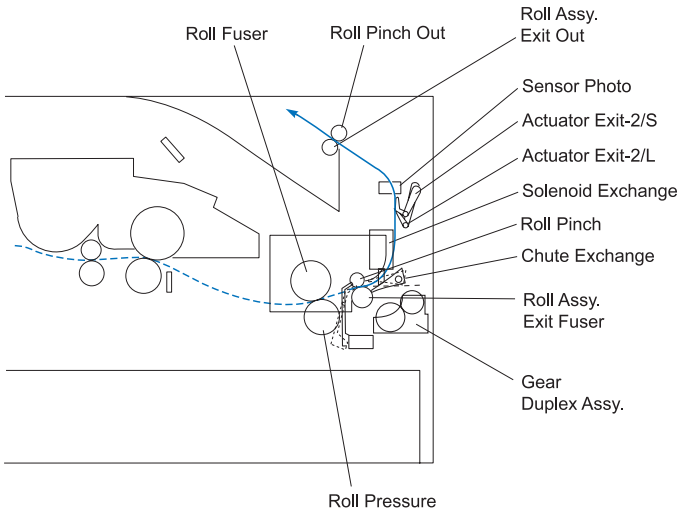
Sensor Pre-Registration and Actuators Pre-Registration A / B:
Detect when a paper reaches the position before the Sensor Registration. The signal from this sensor is used for paper jam detection.

Sensor Registration and Actuator Registration:
Detect when a paper reaches the position just before the EP Cartridge Drum. The signal from the Sensor Registration is used as the reference timing signal for generating the P.SYNC (Page Synchronization) signal inside the MCU. The signal from this sensor is also used for paper jam detection.

Sensor No Paper and Actuator No Paper:
Detect when the Paper Cassette is out of paper.

PAPER TRANSPORTATION I REAR





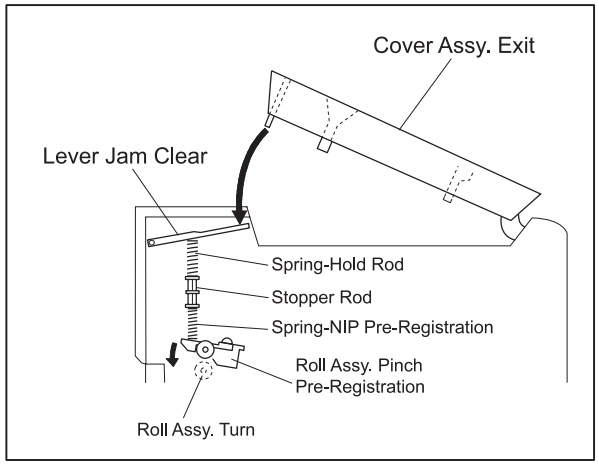
Chute Exchange: Switches the paper path between the exit to the Face Down Delivery Tray on the top of the Cover Assembly Exit and the exit to the optional Duplex Unit or Face Up Catch Tray.

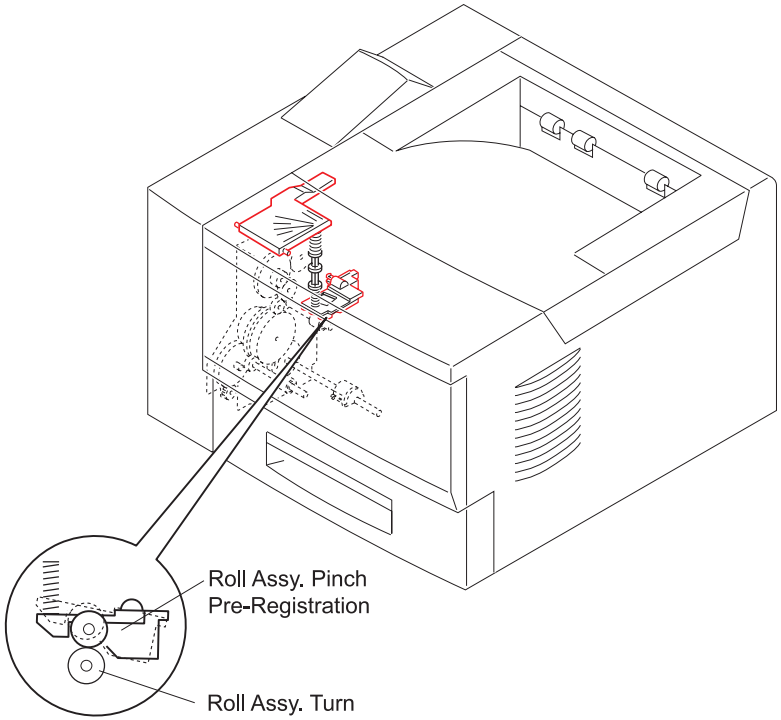
Solenoid Exchange: Switches the position of the Chute Exchange.

Sensor Photo and Actuators Exit-2/L and 2/S:
These Actuators and Sensor detect when paper passes the position just before the exit to the Face Down Delivery Tray. This Sensor Photo (PL3.2.8) is also called Sensor Exit-2 or Exit-2 Sensor in this manual.

Gear Duplex ASSY.: Transmits the drive power generated by the Drive ASSY. Main to the optional Duplex Unit.

PAPER TRANSPORTATION II (1)

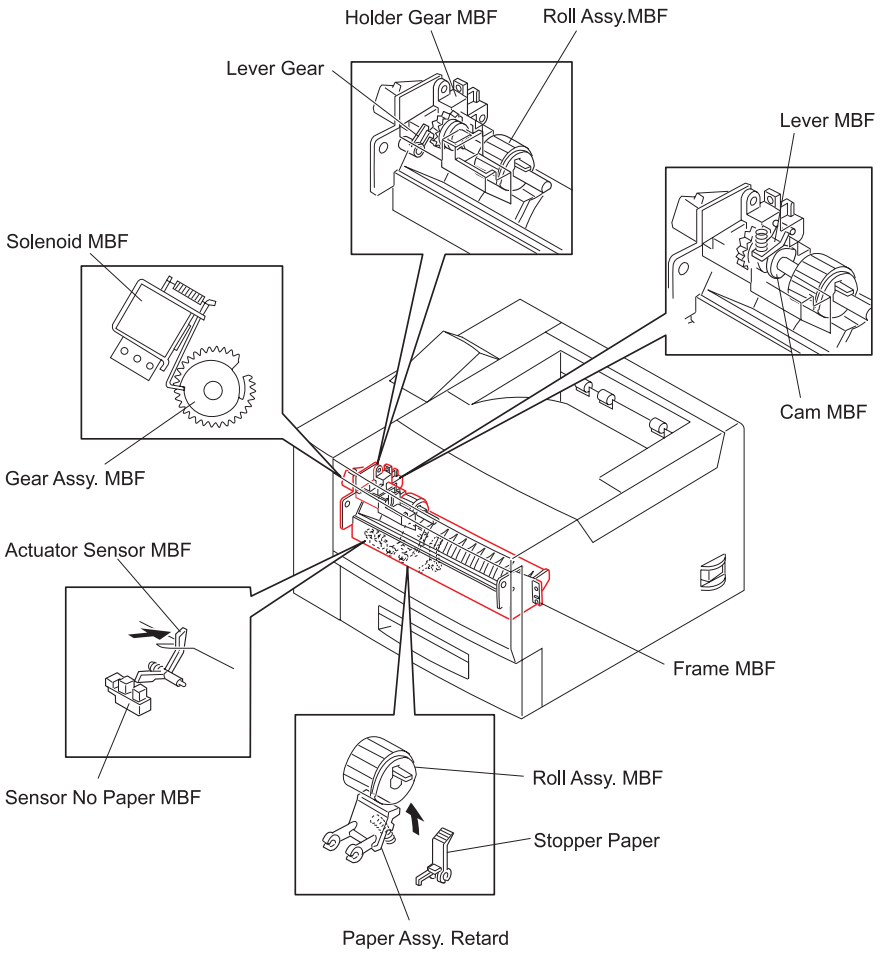




Lever Jam Clear: This lever is pressed down by the Cover Assembly Exit and presses the Roll Pinch Pre-Registration against the Roll Assembly Turn. When the Cover Assembly Exit is open, the Lever Jam Clear is released and releases the Roll Pinch Pre-Registration. This makes jam clear easier.

Roll Pinch Pre-Registration:
This pinch roll is pressed against the Roll Assembly Turn by the Cover Assembly Exit by means of the Spring-Hold Rod, Stopper Rod, and Spring NIP Pre-Registration to drive paper in cooperation with the Roll Assembly Turn.

PAPER TRANSPORTATION II (2)



Solenoid MBF and Gear MBF:

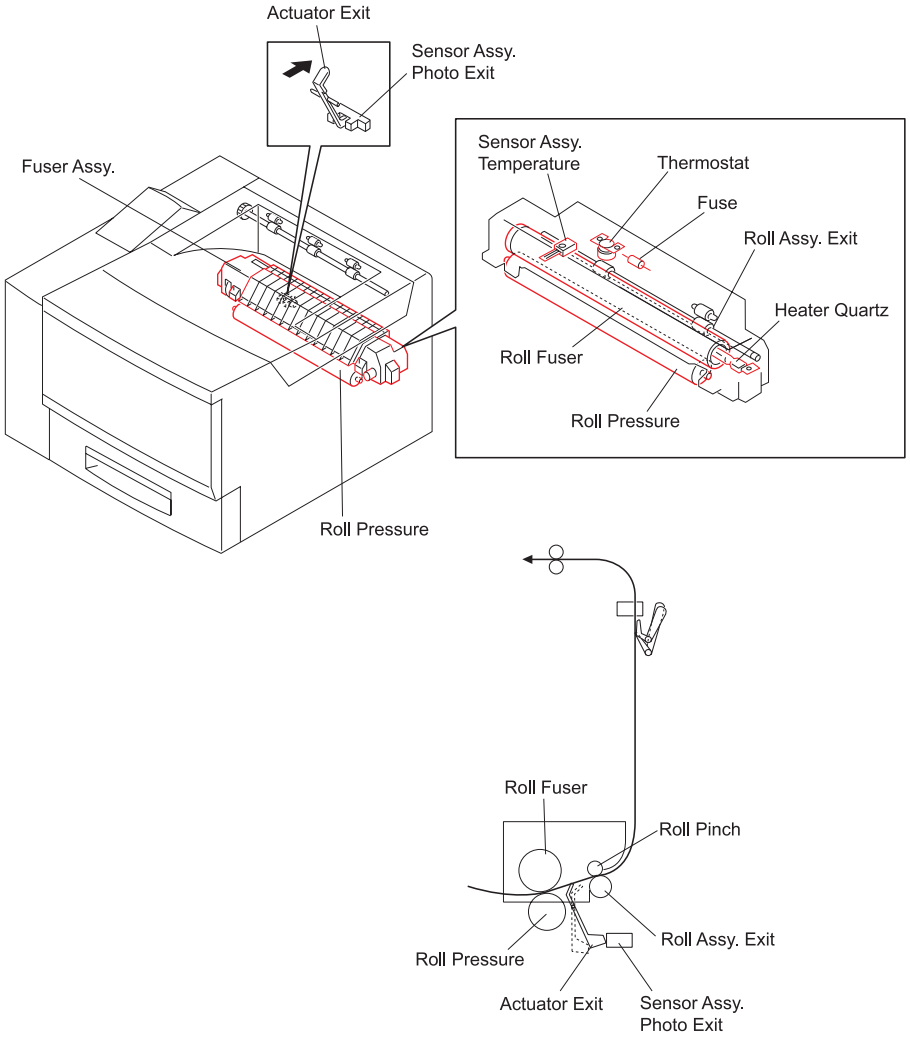
Control the start and stop of the rotation of the Roll Assembly MBF. When the Solenoid MBF is actuated, the MBF Gear is unlatched and engages with the driving gear. The Gear MBF then begins to rotate, causing the Roll Assembly MBF to rotate. After one revolution, the Gear MBF disengage from the driving gear and is latched by the Solenoid MBF.

Roll Assembly MBF: Rotates one turn each time the Solenoid MBF is actuated. The Roll Assembly MBF feeds one sheet of paper out of the MBF by each rotation.

Sensor No Paper MBF and Actuator Sensor MBF:

Detect when the MBF is out of paper.

FUSING AND PAPER EXIT



Sensor Assembly Photo Exit and Actuator-Exit:
Detect when paper passes the position just after the Fuser.

Roll Pressure:
A roll with sponge rubber attached around a metal shaft. The Roll Pressure is pressed up by the springs and applies pressure to the paper passing between itself and the Roll Fuser.

Fuser Unit:

Roll Fuser:
A hollow, surface-coated metal tube that is heated by the Heater lamp held inside the roller. The toner on the paper is melted and bonded to the paper by means of heat and pressure applied by the rollers.

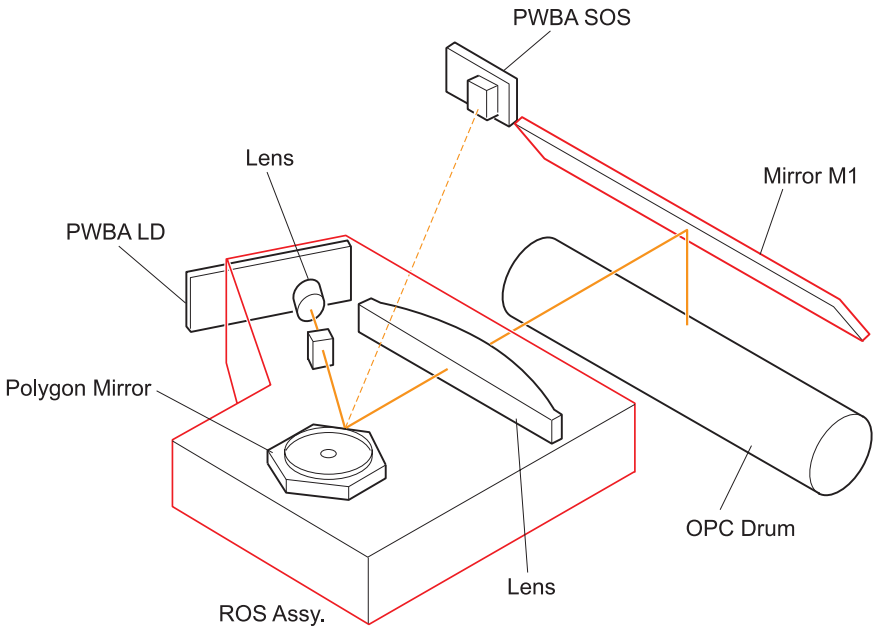
Heater Lamp:
A glass tube with a heat generating coil sealed in it. The Heater Lamp is located inside the Roll Fuser and heats the Roll Fuser.

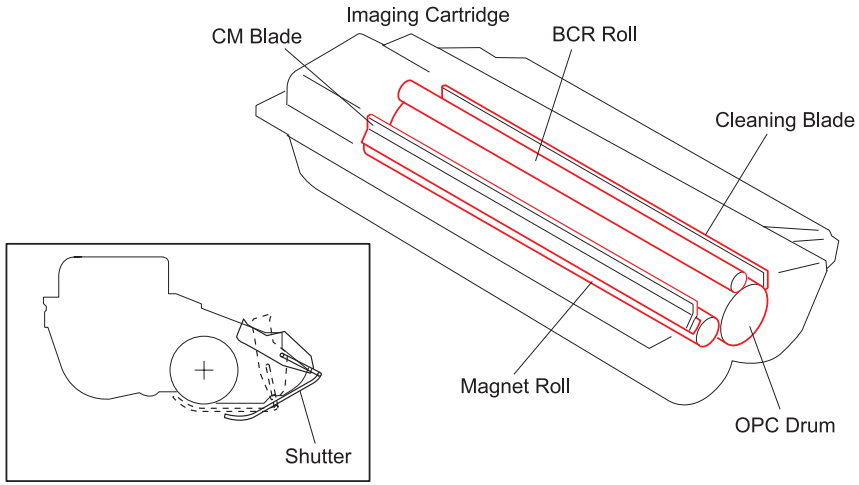
Sensor Assembly Temperature:
A resistor (thermistor) whose resistance varies sharply in a known manner with the temperature. This sensor is held in contact with the surface of the Roll Fuser and monitors the temperature. The signal from this sensor is used to maintain the temperature of the surface of the Roll Fuser within the specified range by switching on and off the AC power to the Heater Lamp. The signal is also used for the first-stage overheat protection.

Thermostat:
Connected in series with the Heater Lamp. The Thermostat functions as the second-stage overheat protection. If the first stage fails to prevent a Fuser overheat, the Thermostat opens the power supply circuit to the Heater Lamp. This Thermostat opens at about 160 °C (inside temperature).

Fuse:
A thermal fuse connected in series with the Heater Lamp. The Fuse functions as the third-stage overheat protection. If both the first and second stages fail to prevent a Fuser overheat, the Fuse opens the power supply circuit to the Heater Lamp. This Fuse melts at about 141 °C.

XEROGRAPHIC MODULES





ROS ASSY:

The ROS (Raster Output Scanner) Assembly scans a laser beam on the drum surface. The ROS Assembly consists of two major components: PWBA LD and Scanner Assembly.

Basic Operation:

The Laser Diode (LD) of the PWBA LD emits laser light. The LD is switched on and off according to the print image signal during printing. The power of the laser light is monitored by the monitor circuit and controlled to be a constant power. The laser light from the LD is shaped and converged into a very thin beam by means of a slit and a Cylinder Lens, and directed to a Polygon Mirror. The Polygon Mirror has six facets and is rotated at a constant speed by the Scanner Motor. These facets reflect the laser beam in turn as the Polygon Mirror rotates. The laser beam reflected by the Polygon Mirror passes through a Correction Lens L1 and is reflected by a Mirror M1 onto the drum surface, moving from one end of the Drum to the other. The laser beam is thus scanned one line by each facet of the Polygon Mirror.

LD Output Power Control:

The drive current of the LD is switched on and off by the Current Switching Circuit in the LDD (Laser Diode Driver) according to the print image signal (/PDATA) from the engine control circuit. The LD drive current while the LD is on is precisely determined by the two DC voltage signals (VLI and VL2) from HMCU. The laser power is monitored using a monitor signal (MO),

which is generated by converting the current flowing through the monitoring Photodiode (PD) integrated in the LD into an analog output voltage by means of a resistor.

Scanner Motor Control:
The Polygon Mirror is rotated by the Scanner Motor (also called ROS Motor). The Scanner Motor is driven at a constant speed by the Scanner Motor Drive Circuit using a phase-locked loop (PLL).

Mirror ASSY: The Mirror Assembly consists of Mirror M1, Shutter and PWBA SOS.

Mirror M1:
Reflects the laser light beam from the ROS to the Drum.

PWBA SOS:
Generates a SOS (Start of Scan) signal. The laser beam hits a photosensor on the PWBA SOS at the beginning of each scan, and the PWBA SOS generates a pulse signal (/SOS). The /SOS signal is used as the reference timing signal for generating LINE SYNC signal.

Shutter Mirror:
The Mirror Assembly has a Shutter Mirror (A) covering or exposing the Mirror M1 and lens of the SOS Sensor. When the Cover Assembly Exit is open, a projection of the Cover pushes down the crank arm of the Shutter to raise the Shutter and expose the Mirror M1 and lens of the SOS Sensor. When the Cover Assembly Exit is open or the Mirror Assembly is removed, the Shutter covers the Mirror M1 and lens of the SOS Sensor to prevent them from collecting dust.

Imaging Cartridge The Imaging Cartridge is composed of following components.

Drum:
An aluminum cylinder with a coating of photoconductive material on the surface. The photoconductive coating (layer) holds an electrical charge placed on the surface while in darkness, and allows the charge to flow through into the conductive layer when exposed to laser light.

BCR (Bias Charge Roll):
Places a uniform electrical charge on the drum surface, erasing any patterns of decreased charge remaining from the previous cycle.

Magnet Roll:
Holds toner on the surface in a thin layer and transports it to the gap between the drum and the Magnet Roll. Toner is supplied to the Magnet Roll from the Toner Compartment.

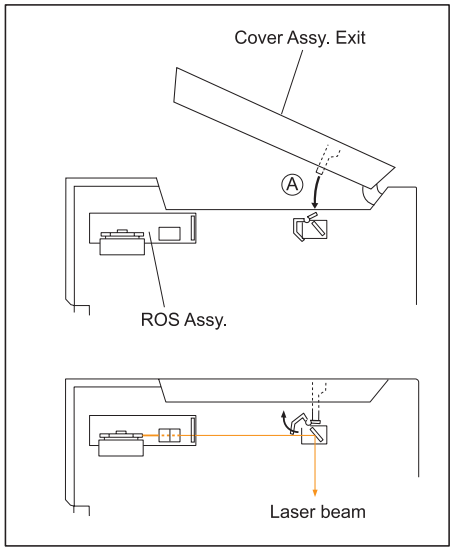
CM Blade (Charging and Metering Blade):
Spreads toner on the Magnet Roll in a thin layer, and also gives toner a negative charge.

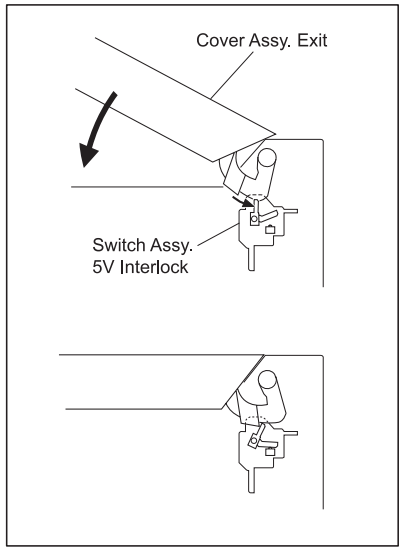
Cleaning Blade:
Scrapes the toner remaining after the Transfer step off of the Drum surface.

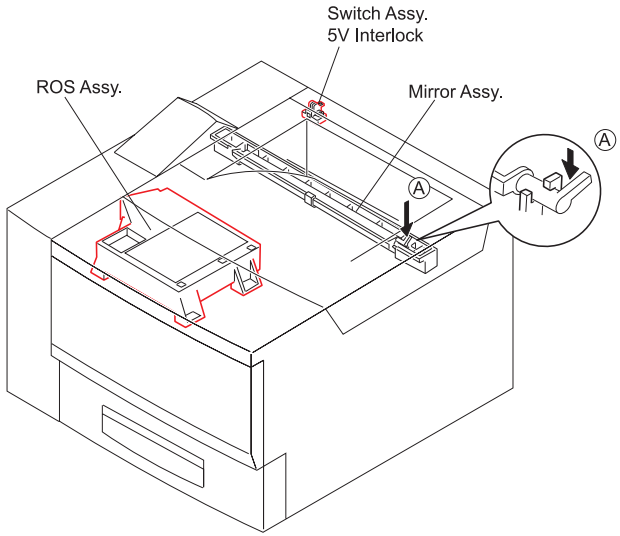
BTR: The BTR (Bias Transfer Roll) is in contact with the Drum and rotates along with the Drum being driven by the Drum Gear. The BTR applies a positive charge to the back side of the paper when the paper travels between the BTR and the Drum. The toner image transfers from the Drum surface to the front side of the paper being attracted by the positive charge on the back side of the paper.

Sensor Toner: A magnetic sensor that detects when toner is low in the Toner Compartment of the Imaging Cartridge. (Amount of toner is monitored by both Sensor Toner and a software counter, and “Toner Low” message is displayed whenever the condition is detected by Sensor Toner, prior to the status of software counter.)

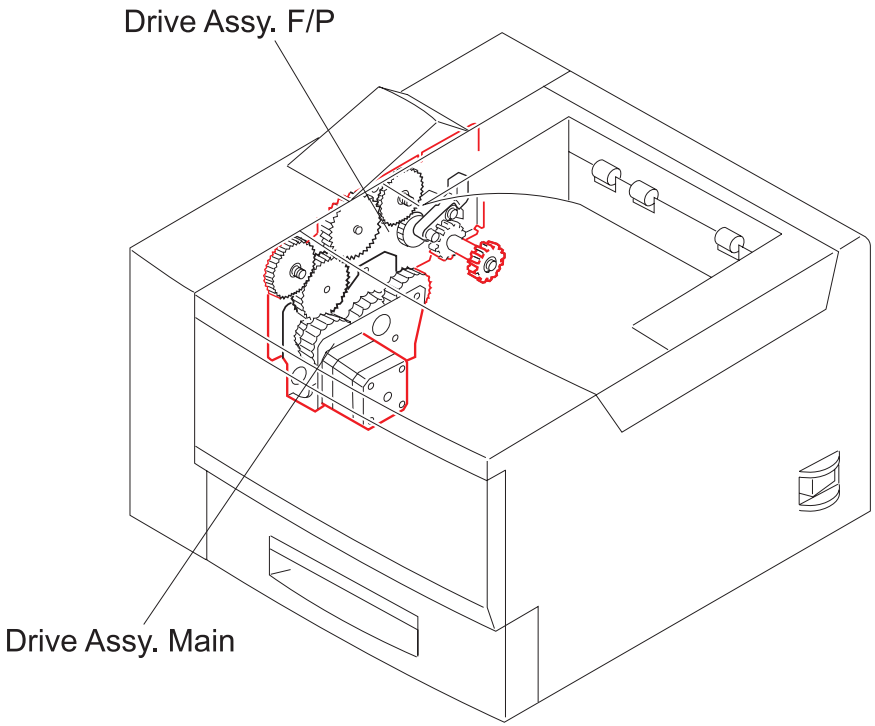
Switch Assembly 5V Interlock:
Detects the closing of the Cover Assembly Exit as illustrated in figure below. The signal is used in the control circuit for the Printer.


Cover Assy. Exit
A
ROS Assy.
Laser beam


Cover Assy. Exit
Switch Assy.
5V Interlock


Switch Assy.
5V Interlock
ROS Assy.
Mirror Assy.
A
A

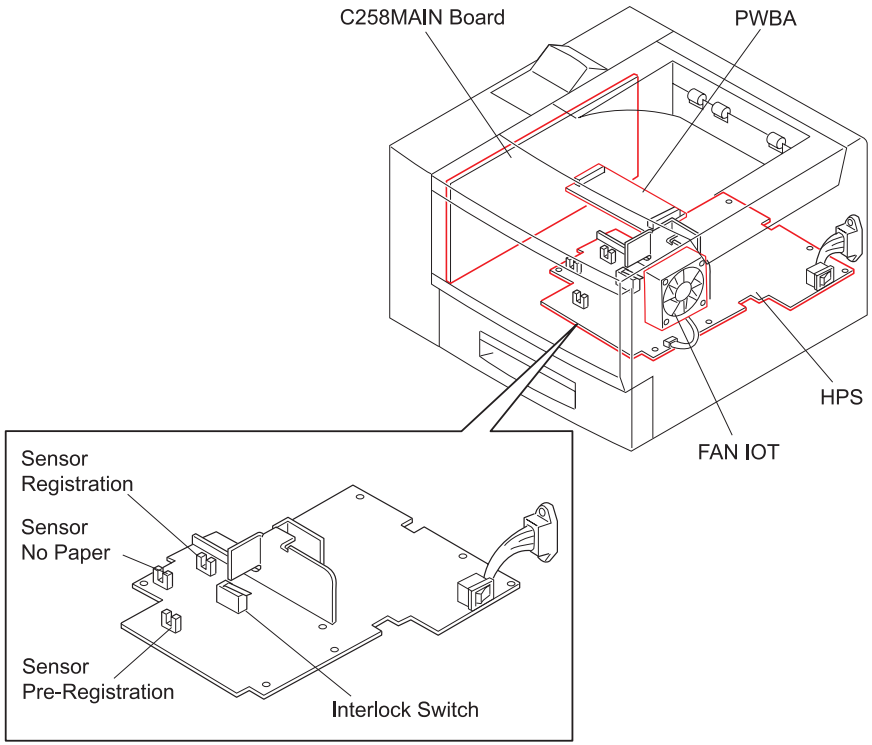
DRIVE MODULES



Drive ASSY. Main: Includes the Motor Assembly Main (Main Motor) and the Gear Cluster. The Main Motor generates the drive power, and the Gear Cluster distributes the drive power to the Roll Assembly Registration, Drum and BTR, and Drive Assembly-F/P.

Drive ASSY.-F/P: Transmits the drive power from the Drive Assembly Main to the Roll Assembly Exit Out and the Roll Fuser (also called Heat Roll), Roll Assembly Exit, and optional Duplex Unit. The transmission of the drive power to the Roll Fuser is switched on and off by a floating idler gear. When the Cover Assembly Exit is closed, a molded tab of the Cover presses down on the floating idler gear to engage it with the Roll Fuser gear. When the Cover is open, the tab of the Cover releases the floating idler gear. The floating idler gear then disengages from the Roll Fuser driving gear and interrupts the drive power transmission to the Fuser.

ELECTRICAL MODULES



Fan IOT: Expels the air inside the printer and introduces fresh air into the printer to prevent an excessive rise of the inside temperature.

HPS: Has the Main Power Switch, Interlock Switch, Sensor Registration, Sensor Pre-Registration, Sensor No Paper, LVPS (Low Voltage Power Supply) circuit, and HVPS (High Voltage Power Supply) circuit on it. The HPS also has the switching circuit to switch on and off AC power to the Heater Lamp of the Fuser Unit.

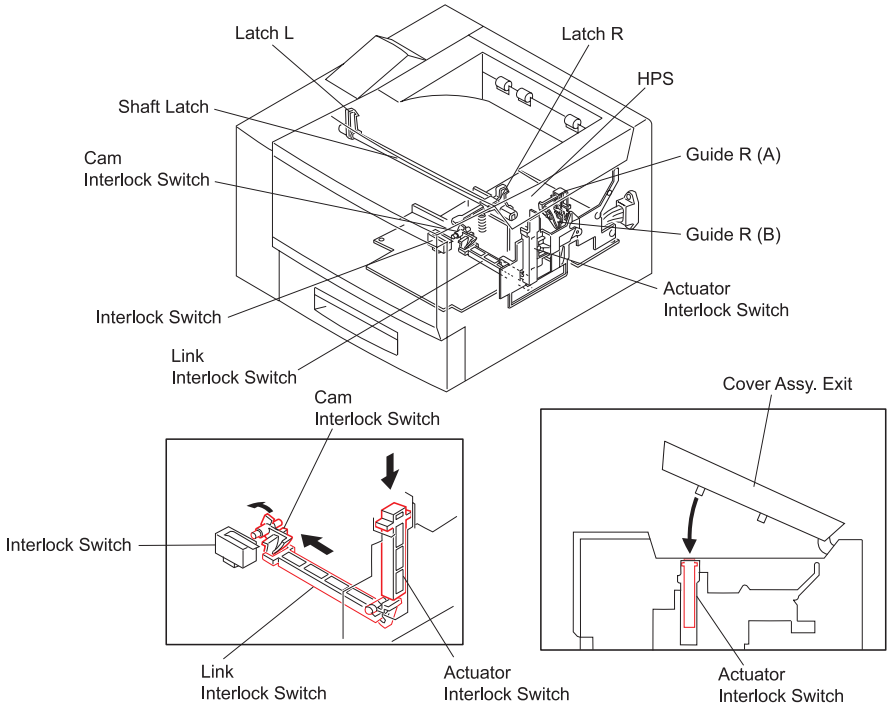
Interlock Switch:
Opens the 24 VDC circuit from the LVPS to the controller when the Cover Assembly Exit is open.

LVPS:
Produces regulated low DC voltages (5V supplied to logic circuits, 5V-LD supplied to the Laser Diode, and 24V supplied to motors, solenoids, and clutches) from the AC power.

HVPS:
Produces high AC and DC voltages used for charge (BCR), development (Magnet Roll), transfer (BTR), and detack (Detack Saw) in the print process.

C258MAIN Board: This is a main control circuit of the EPL-N1600 and contains two major circuits: image processing main control circuit and MCU (Machine Control Unit) which directly controls all printer operations responding to signals from the main control circuit.

FRAME



Actuator Assembly Link Interlock Switch, and Link Interlock Switch:
When the Cover Assembly Exit is closed, a molded projection of the Cover Assembly Exit presses down the Actuator Assembly Link Interlock Switch, which in turn press the Link Interlock Switch to the Interlock Switch. The Interlock Switch is therefore held On when the Cover Assembly Exit is closed. When the Cover Assembly Exit is open, the Actuator Assembly Link Interlock Switch is released, and the Link Interlock Switch is moved away from the Interlock Switch by the force of the spring. The Interlock Switch is therefore Off when the Cover Assembly Exit is open.

Drum Shaft Latching: Guide R (A), Guide R (B), and Spring. When the Cover Assembly Exit is closed, a molded projection of the Cover Assembly Exit pushes down the Guide R (A). The EP Cartridge is thus held in place by the Guide R (A) in cooperation with the Guide R (B). When the Cover Assembly Exit is opened, the Lever Latch is pulled up by the Spring to turn the Latch Shaft away from the Dram Shaft, releasing the EP Cartridge.

Latches L/R and Latch Shaft:
Hold the Cover Assembly Exit in the closed position.

2.1.4 Main Control Circuit

The main control circuit of the EPL-N1600 is the C258MAIN Board and it consists of two sections: the main control circuitry and the engine control circuitry (MCU). The following tables describe the main components of each section.

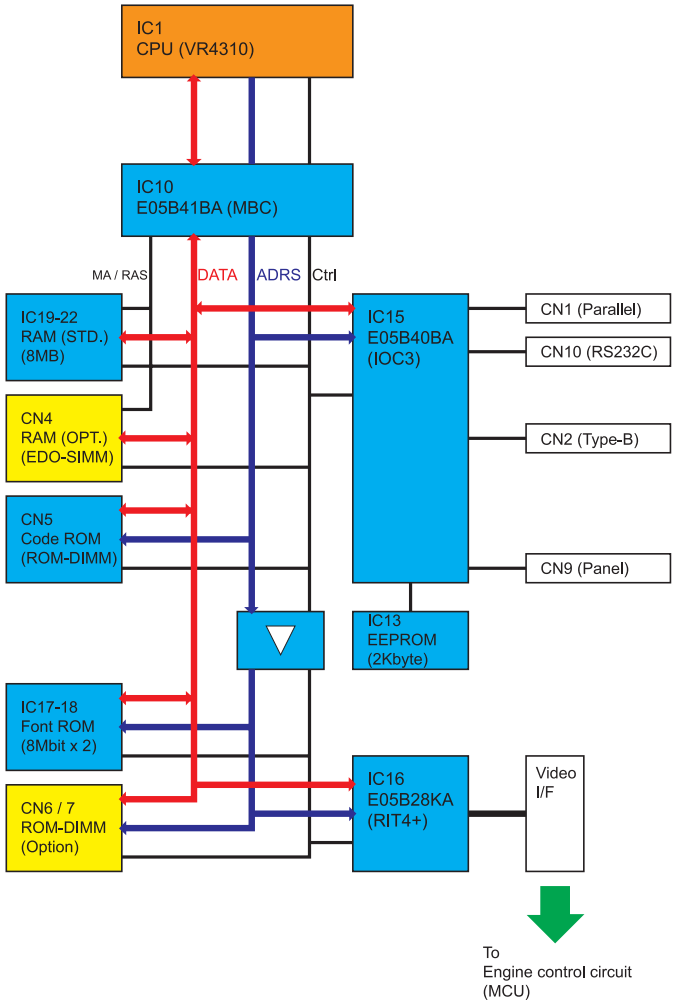


Figure 2-3. CIRCUIT BLOCK DIAGRAM - C258MAIN BOARD

Table 2-2. C258MAIN BOARD - Main Control Circuit

Component	Location	Operation
CPU (VR4310) µPD30200GD	IC1	A RISC CPU running at 150MHz. Controls the board's main control section.
ASIC E05B41BA	IC10	Controls the following: • Memory access (RAM/ROM) • DMA (I/O, Video)
ASIC E05B40BA	IC15	Controls the following: • External interfaces • Communication with the operation panel • Interrupts
ASIC E05B28KA	IC16	Controls the following: • Video data generation • RIT/PGI operation • Video interface (communication with the engine control section)
DRAM	IC19-22	Two 16Mbit ((16) modules. Serve as the system's standard memory.
Mask ROM	IC17/18	8Mbit mask ROM. Stores font dataand IPL.
Program ROM	CN5	Either C215PROG (Flash ROM version) or C215PROG-B (Mask-ROM version) ROM-DIMM module is installed in ROM-DIMM socket CN5.
EEPROM (NM93C86A)	IC13	16Kbit EEPROM which saves printer configurations and status.

Table 2-3. C258MAIN BOARD - Engine Control Circuit (MCU)

Component	Location	Operation
CPU (PD78054)	IC201	Engine control CPU. Controls engine components (implements printing) in accordance with video data from the main control section.
ASIC (PD65622GF)	IC202	Controls the video interface with the main control section. Also controls EEPROM.
EEPROM (AT93C45)	IC203	Capacity is 16Kbit. Stores setup parameters related to engine control.

CHAPTER

3

TROUBLESHOOTING

3.1 OVERVIEW

This section describes the possible steps to troubleshoot and repair the printer. Due to a complexity of the laser printer, most effective approch to troubleshoot the problem is either checking the printer in accordance with the error message displayed by the printer or the printed image quality.

3.1.1 Service-Call Errors

This printer has a built-in diagnostic function and If the printer detects an error which is not recoverable by the user, the printer displays “Service Req” message with corresponding error type code. You can identify the problem by referring to the type of error and a component identified as defective is need to be replaced to new one to solve the problem. The table shown in right lists the Service-Call errors.

Table 3-1. Service-Call Errors

Error Type “e”	Error Code “ffff”	Description
E (Engine)	0003	Fusing ASSY. Problem
	0004	ROS Assy. Problem
	0005	Fan Motor Problem
	0008	EEPROM Failure (in Engine Control Circuit)
	0014	Communication Error (between main control circuit and engine control circuit)
C (Controller)	0017	CPU Error (undefined interrupt)
	0081	CPU Error (TLB modification exception)
	0082	CPU Error (TLB mistake exception [Load/Fetch])
	0083	CPU Error (TLB mistake exception [Store])
	0084	CPU Error (address error exception [Load/Fetch])
	0085	CPU Error (address error exception [Store])
	0086	CPU Error (bus error exception [Fetch])
	0087	CPU Error (bus error exception [Load/Store])
	0088	CPU Error (SYSCALL exception)
	0089	CPU Error (Break exception)
	0090	CPU Error (Reserved instruction exception)
	0091	CPU Error (coprocessor unused exception)
	0092	CPU Error (FPU exception)
	0093	CPU Error (TLB exception)
	0094	CPU Error (XTLB exception)
	0095	CPU Error (cache exception)
	0096	CPU Error (Trap exception)
	0097	CPU Error (FPU exception)
	0098	CPU Error (watch exception)
	0128	CPU Error (undefined trap)
	0129-0254	CPU Error (undefined trap)
	0255	CPU Error (NMI exception)
	0256	CPU Error (division by zero)
	0257	CPU Error (processing overflow)
	0258	CPU Error (break generated)

Error Type "e"	Error Code "ffff"	Description
C (Controller)	0800	IPL Error (controller failure)
	1000	Standard RAM Error (no RAM, etc.)
	1001	Standard RAM Error (no minimum stack area, etc.)
	1002	Standard RAM Error (less than standard size, etc.)
	1003	Expansion RAM Error
	1100	ROM Checksum Error (bit0 - 15) (Font)
	1101	ROM Checksum Error (bit16 - 31) (Font)
	1120	ROM Checksum Error (bit0 - 7) (Program)
	1121	ROM Checksum Error (bit 8 -15) (Program)
	1122	ROM Checksum Error (bit16 - 23) (Program)
	1123	ROM Checksum Error (bit24-31) (Program)
	1170	Option FONT ROM Checksum Error
	1180	Option ROM Module A Checksum Error
	1181	Option ROM Module B Checksum Error
	1185	Unsupported ROM Module
	1200	EEPROM Write Error
	1210	EEPROM Write Count Limit Error
	1400	Printer Engine Initialization Failure
	1999	Other Hardware Error
	2000	Software Error

3.1.2 Printer Messages

The LCD panel of the control panel unit is used to display various printer status and error condition. There are three types of message displayed by the printer: Status Message, Error Message and Warning Message.

The table below lists all messages displayed by the printer. The order of list is corresponding to a display priority of each message.

Table 3-2. Printer Messages

Priority	Message	Type
Higher	Service Req. effff	Service-call error
	ROM check	Status
	RAM check	Staus
	Self Test	Status
	Reset All	Status
	Reset	Status
	Duplex Unit Fail	Error
	Check Duplex P-Size	Error
	Exiting Paper Jam	Error
	Paper Jam	Error
	Feed Jam	Error
	Paper Jam in Duplex	Error
	Jam in Duplex Tray	Error
	Jam in Duplex Cover	Error
	Insert Imaging Crtg	Error
	Printer Open	Error
	Duplex Cover Open	Error
	Insert Duplex Tray	Error
	Manual Feed xxx yyyy	Error
	Insert LC1	Error
	Paper Out sssss tttt	Error
	Paper Set sssss ttttt	Error
	Print Overrun	Error
	Illegal Aux I?F Card	Error
	Mem Overflow	Error
	Duplex Mem Overflow	Error
	Illegal DIMM A	Error
	Write Error DIMM A	Error
	Reset to Save	Status
	Writing DIMM A	Status
	Menus Locked (at panel setting operation)	Warning
	Duplex print was off	Warning
	Face Up print off	Warning
	Check Paper Size	Warning
	Image Optimum	Warning
	Need Memory	Warning
	Format Error DIMM A	Warning
	Form Feed (during test prinitn)	Status
	Warming Up	Status
	Toner Low	Warning
	Standby	Satus
Lower	Ready	Status

3.1.2.1 Status Messages

The table below shows the Status message displayed by the printer and the meaning of each message.

Table 3-3. Printer Message - Status

LED	Description	Action
ROM check		
Online: Continue:	The printer is checking checksumm and format of program ROM.	-----
RAM check		
Online: Continue:	The printer is checking function and capacity of RAM memory.	-----
Self Test		
Onlin: Continue:	The printer is performing diagnostics and initialization process.	-----
Reset All		
Online: Continue:	The warm-boot process is in progress. When the warm-boot process completes, the message is changed to “Reset” and perform the reset operation.	-----
Reset		
Online: Continue:	The reset process is in progress.	-----
Reset to Save		
Online: OFF Continue:	The panel settings is changed by the panel setting mode during print job process.	The mesage is cancelled by one of the following operation: • Press Online button and the panel settings is cacelled. The printer is back to Readt state. • Perform Reset or Warm-boot process. The panel settings becomes valid and all print jobs are cancelled.
Writing DIMM A		
Online: Continue:	The printer is writing data to the ROM module	*Do not remove the module or turn the printer off while the printer is writing the data.
Form Feed		
Online: Continue:	The printer is priting the remaining print job.	-----
Warming Up		
Online: Continue:	One of READY state message. The printer is in warm-up process.	-----
Offline		
Online: OFF Continue:	The printer is not ready to start printing operation.	Press Online button to back to Ready state.
Standby		
Online: Continue:	The printer is in stand-by state (Power save mode).	-----

3.1.2.2 Error Messages

The table below lists the error messages and an operation to be performed. When any error state is detected by the printer, the Online LED goes off and the Conitnue LED indicates the following three conditions.

Continue LED = OFF: If the error condition can be removed, the printer restarts automatically without pressing the Continue button.

Continue LED = Blink: The printer restarts when the Continue button is pressed. If “Auto-Cont” is ON in the device menu, the error status is cancelled automatically after the specified period of time has passed.

Continue LED = ON: The printer restart only when the Continue button is pressed after removing the error.

Table 3-4. Printer Message - Error

LED	Description	Action
Duplex Unit Fail		
Online: OFF Continue: OFF	The duplex unit becomes unvalid during power on.	Turn the printer off and re-install the duplex unit.
Check Duplex P-Size		
Online: OFF Continue: Blink	Occurs only during duplex printing, if “Size Ignore=Off” has been selected in Device menu. The paper loaded is shorter than the paper size specified for printing. If the error occur at first face printing, the printer eject the sheet without printing next face.	Set correct paper in the printer and press Continue button. Then restart printing.
Exiting Paper Jam		
Onlin:OFF Continue:OFF	A paper jam has occured at the Fusing process.	Open the top cover and remove the imaging cartridge. Then remove jammed paper inside the printer. The error state will be cancelled automatically by closing the top cover and the printer resume the printing after warm-up.
Paper Jam		
Online: OFF Continue: OFF	A paper jjam has occured at the image transfer process.	Open the top cover and remove jammed paper. The error state will be cancelled automatically by closing the top cover and the printer resume the printing after warm-up
Feed Jam		
Online: OFF Continue: OFF	A paper jam has occured at the paper entrance. If another paper jjam has occured at thhe same time, the error message displayed on the LCD will be the one corresponding to another paper jam, such as “Paper Jam”.	Open the top cover and check for any jammed paper at the paper entrance. The error state will be cancelled only when the top cover is closed. The printer wil resume printing after warm-up.
Paper Jam in Duplex		
Online: OFF Continue: OFF	A paper jam hhas occured in the Duplex Unit.	Open the Duplex Unit and remove any jammed paper. The error state will be concelled automatically by closing the Duplex Unit.
Jam in Duplex Tray		
Online: OFF Continue: OFF	A paper jam has occured in the Duplex Tray.	Take out the Duplex Tray and remove jammed paper. The error state will be cancelled by reinstalling the Duplex Tray. The printer resume printing from first face after warm-up.

LED	Description	Action
Jam in Duplex Cover		
Online: OFF Continue: OFF	A paper jam has occured in a rear cover of the Duplex unit.	Open the Duplex Unit and remove any jammed paper. The error state will be concelled automatically by closing the Duplex Unit. The printer resume printing from the first face after warm-up.
Insert Imaging Crtg		
Online: OFF Continue: OFF	The imaging cartridge is not installed in the printer.	Open the top cover and install the imaging cartridge.
Printer Open		
Online: OFF Continue: OFF	The top cover is open.	Close the top cover.
Duplex Cover Open		
Online: OFF Continue: OFF	A rear cover of the Duplex Unit is open.	Close the cover.
Insert Duplex Tray		
Online: OFF Continue: OFF	The tray is not set inside the Duplex Unit.	Reinstall the tray.
Manual Feed xxx yyyy		
Online: OFF Continue: Blink	If “Manual Feed=On” has been selected, this error occurs when the printer receives the print job. xxx: Paper supply source yyyy: Paper size	Do one of the following: • Set the paper in specified paper supply and press either Online or Continue button. The printer prints with the specified paper supply and indicates the same error again at next page printing. • Press either Online or Continue button. The printer feeds a paper from the paper supply with highest priority. • Perform Reset or Warm-boot.
Insert LC1		
Online: OFF Continue: OFF	Standard cassette is not set in the printer.	Reinstall the paper cassette.

LED	Description	Action
Paper Out sssss tttt		
Online: OFF Continue: OFF	This error occurs when: • no paper is available in the selected paper supply. • no paper is available in all connected paper suppy units. If the error occurs with this condition, the message will display “LC1” as sssss.	Set specified size of paper in the seletced paper supply.
Paper Set sssss tttt		
Online: OFF Continue: Blink	In case if ‘Size Ignore=Off” has been selected in Config. Menu, this error occur when the paper size in the selected paper supply and the paper size specified for printing is different.	1. If “Auto Cont=OFF”: The error can be cancelled by either: • Press Continue button after putting a specified size of paper in the selected paper supply • Press Continue button without changing the paper in the selected paper supply. 2. If “Auto Cont=ON”: In this case, the error is cancelled automatically after passing the specified period of time, and the printer resume printing by feeding a paper from the selected paper supply.

LED	Description	Action
Print Overrun		
Online: OFF Continue: Blink	Due to complexity of print job data, the printer is unable to continue the data process and causing an overrun.	1. If “Auto Cont=OFF”: The error can be cancelled by either: • Press Continue button causes the printer to retry printing with all available vacant memory. If no memory left or printing failed again, the corresponding page is deleted and processing the next page. • Perform Rest or Warm-boot, and retry printing by setting “Auto Cont=ON”. 2. If “Auto Cont=ON”: In this case, the error is cancelled automatically after passing the specified period of time, and the printer retry priting as case-1) above.
Invalid AUX I/F Card		
Online: OFF Continue: OFF	The optional I/F card which is not supported by this printer, is installed.	Turn the printer off and remove the I/F card.

LED	Description	Action
Mem Overflow		
Online: OFF Continue: Blink	Memory capacity become insufficient during the data process.	1. If “Auto Cont=OFF”: The error can be cancelled by either: • press Continue button and a printer operation is different afterwards depending on the cause of error. If a buffer overflow is a cause of error, a command causing the error is discarded and the page processed already is ejjected. If the error occurs when processing the first face of duplex print data, the page is ejected with only first face printed, and a second face is printed on next page. In case if the error occurs while registering a Macro-pattern, a command causing the error is discarded and the printer continue the process. • perform Reset or Warm-boot. 2. If “Auto Cont=ON”: In this case, the error is cancelled automatically after passing the specified period of time, and the printer operates as case-1).

LED	Description	Action
Duplex Mem Overflow		
Online: OFF Continue: Blink	The available memory is insufficient to process the data for second face of duplex printing. The printer only prints first face and eject the page.	1. If “Auto Cont=OFF”: The error can be cancelled by either: • Press Continue button causes the printer to reprocess the data for second face and print it on the second face of nnext page. • Perform Rest or Warm-boot, and retry printing by setting “Auto Cont=ON”. 2. If “Auto Cont=ON”: In this case, the error is cancelled automatically after passing the specified period of time, and the printer print a second face as case-1) above.
Invalid ROM A		
Online: OFF Continue: OFF	Unusable ROM module is installed. (i.e ROM module that not being formatted and write-protected, or defective one.)	Turn the printer off and remove the ROM module.
Write Error ROM A		
Online: OFF Continue: OFF	The printer tried to write on write-protected ROM module, or writing operation was incomplete. Or ROM module is not installed in Slot-A.	Perform wither:: • Turn the printer off and remove the ROM module • Perform Reset-All operation.

3.1.2.3 Warning Messages

The table below lists the warning messages. The Warning message is only displayed on the LCD panel and the state is not affect the printer' s operation.

Table 3-5. Printer Message - Warning

LED	Description	Action
Duplex Print was Off		
Online: Continue:	Printing was performed with a paper that not supported for duplex printing. • Envelopes • OHP • Thick papers	Press Continue button to cancel the warning.
Face Up print off		
Online: Continue:	Face up exit is selected when printing with Gov. Legal or Legal size paper. The printed page is forcibly ejected at Face down exit.	Press Cotinue button or perform Reset / Warm-boot to cancel the warning.
Check Paper Size		
Online: Continue:	This warning is only displayed when "Size Ignore=OFF" has been selected. The paper actually fed is shorter than the paper size for printing. The warning do not appear with the following papers: DL/C5/COM10/Monarch/A5/ Half Letter/Government Letter/ F4/C6International B5/Custom	Press Continue button to cancel the warning or perform Reset or Warm-boot.
Image Optimum		
Online: Continue:	Due to insufficient memory capacity, printing was unable to complete at the specified resolution.	Press Continue button to cancel the warning or perform Reset or Warm-boot to forcibly cancel the printing process.
Need Memory		
Online: Continue:	The printer performs memory compression/expansion operation when detecting low memory capacity during print data processing. This warning occurs when the number of memory compression is exceeding the predefined number.	Press Continue button to cancel warning or perform Reset or Warm-boot to forcibly cancel the image processing. Adding an optional memory is recommended.
Format Error ROM A		
Online: Continue:	This warning occurs when installed ROM module is not formatted. If this warning displayed with the ROM module to which the data has been written, the ROM module should be defective or the data writing is not fully completed, and the ROM module should be removed.	Press Continue button or turn off the printer and remove the ROM module.
Toner Low		
Online: Continue:	The amount of remaining toner is decreased. The amount of toner is calculated by software.	Press Continue button to cancel the warning.

3.2 Troubleshooting

The basic troubleshooting is divided into three catogories and the procdures to follow for proceeding the troubleshooting is outlined in the flowchart shown below.

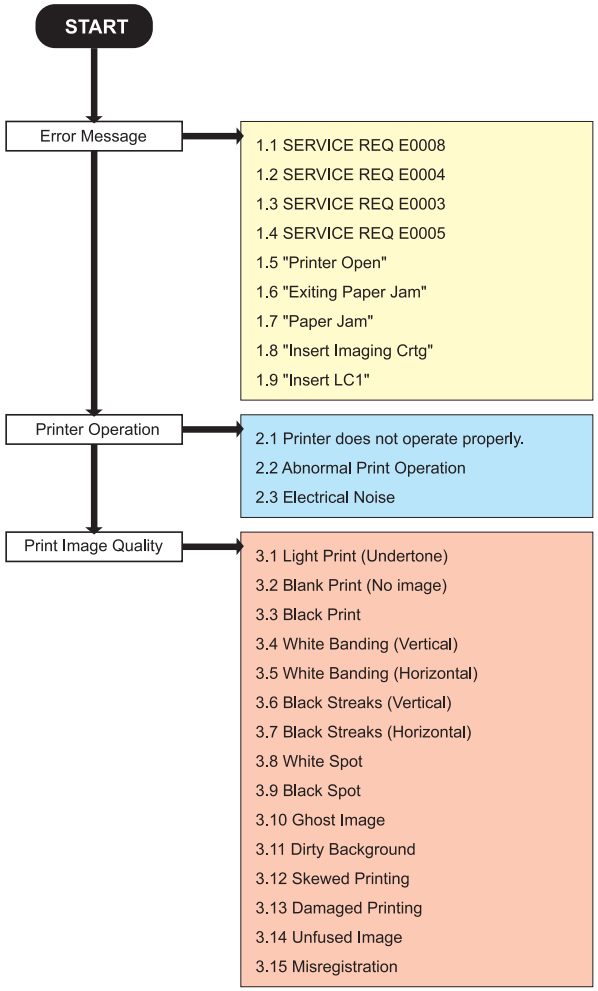


Figure 3-1. Troubleshooting Flow

3.2.1 Troubleshooting with Error Messages

1.1 SERVICE REQ E0008

Read or write error is occured with the EEPROM on the Engine control circuit.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • C258MAIN BOARD		
1	Switch printer power on and off several times. Does this error occur whenever printer power is switched on?	Replace the C258MAIN Board.	-----

1.2 SERVICE REQ E0004

The ROS (Raster Output Scanner) Assy. is defective.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Harness Assembly ROS • Harness Assembly SOS		
1	**SCANNER MOTOR** Unplug J27 (Main Drive Motor) from CN227 of the C258MAN and J222 (Fan) from the HPS. 1. Run a test print. 2. Listen for the sound of the Scanner Motor. Can you hear the Scanner Motor running before the U2 code appears?	Go to step 3.	Replace the ROS Assembly.
2	**LASER DIODE POWER** 1. Remove the Main Cover. 2. Remove the Lever Jam Clear. 3. Switch on printer power. 4. Cheat the Main Interlock Switch. 5. Do not unplug P/J262. 6. Check the voltage between P262-7 and P262-5 on the PWB LD. Is there +5 VDC between P262-5 and P262-7?	Replace the ROS Assembly.	Go to step 4.
3	**+5 VDC POWER SUPPLY** 1. Remove the Cover Side, and then C258MAIN board. 2. Check the voltage between: -FG and J31-A10 -FG and J31-A11 -FG and J31-B11 **Is there +5VDC between:** **FG and J31-A10** **FG and J31-A11** **FG and J31-B11?** Note: Since there is no convenient test point on the HPS to check for +5VDC, this step has you check four separate +5VDC voltages that run from the HPS through the PWBA Hotaru and on to the C258MAIN through J31. Although not a foolproof test, it should give you some indication of whether or not the +5VDC portion of the HPS is working correctly. Failure to read +5VDC on any of the test points most likely reflect a HPS failure, but in some cases an PWBA Hotaru or C258MAIN failure may give you the same readings.	Replace the C258MAIN.	Replace the HPS.

1.3 SERVICE REQ E0003

The Fuser Assy. is defective.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Fuser Assembly		
1	**TEMPERATURE SENSORS** 1. Unplug J292 from P/J291. 2. Check the continuity between the two black wires on J292 (Leading to the Sensor Assembly Temperature). 3. Check the continuity between the two white wires on J292 (leading to the Sensor Assembly Temperature). Are there a few hundreds ohms between the two black wires and between the two white wires on J292?	Go to step 2.	Replace the Sensor Assembly Temperature.
2	**HEATER LAMP CIRCUIT** 1. Unplug the AC power cord from the AC wall outlet. 2. Unplug J11 from the HPS. 3. Check the continuity between the two wires on J11. Is there continuity (approximately 2.5Ω) between the two wires on J11?	Go to step 6.	Go to step 3.
3	**HEAT LAMP** 1. Remove the Heater Lamp. 2. Check the continuity between the two ends of the Heat Rod. Is there continuity (approximately 2.5Ω) between the two ends of the Heat Lamp?	Go to step 4.	Replace the Heater Lamp.
4	**FUSE** Check the continuity between the two ends of the Fuse. Is there continuity (0Ω) between the two ends of the Fuse?	Go to step 5.	Replace the Fuse
5	**THERMOSTAT** Check the continuity between the two ends of the Thermostat. Is there continuity (0~2Ω) between the two ends of the Thermostat?	Go to step 6.	Replace the Thermostat.
6	**HEATER LAMP POWER SUPPLY** 1. Reinstall the Fuser, if it was removed during a previous step. 2. Switch ON printer power. 3. Check the voltage between the two wires on P/J11. Is there 90~132VAC (110VAC model) or 198~264VAC (220VAC model) even momentarily between the two wires on P/J11 before the U4 code appears?	Replace C258MAIN BOARD.	Replace the HPS with new one.

1.4 SERVICE REQ E0005

Fan IOT unit or Duplex Unit Fan is in trouble.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Fan IOT • Fan Assembly Duplex • HPS • PWBA Hotaru • C258MAIN Board		
1	**FAN IOT** Does the Fan rotate when you switch on printer power?	Go to step 3.	Go to step 2.
2	**FAN SIGNAL** 1. Disconnect P/J222 from the HPS. 2. Check the voltage between P/J222-3 and P/J222-1. Is there +12~24VDC between P/J222-3 and P/J222-1?	Replace the Fan.	Replace the HPS.
3	**PWBA HOTARU** 1. Remove the PWBA Hotaru. 2. Check for the continuity between P21-B2 and P31-B12. Is there continuity between P21 and P31?	Replace the C258MAIN Board.	Replace the PWBA Hotaru.

1.5 ERROR MESSAGE “PRINTER OPEN”

Check if the above error displayed even if the Cover Assy. Exit is closed.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Interlock Switch actuating mechanism • Interlock Switch (on HPS) • HPS • PWBA Hotaru • C258MAIN Board		

Step	Actions and Questions	Yes	No
1	**INTERLOCK SWITCH ACTUATOR TAB ON COVER ASSEMBLY EXIT** Is the actuator tab in place on the Cover Assembly Exit; not damaged nor deformed?	Go to step 2.	Replace the Cover Assembly Exit.
2	**INTERLOCK SWITCH ACTUATING MECHANISM** Press down on the Actuator Interlock Switch directly by a small-diameter screwdriver through the inside hole of the Spring Actuator. Is there a small clicking sound of actuation of the Interlock Switch when you press down on the Actuator Interlock Switch, and is there a slow spring-action return when you release the Actuator Interlock Switch?	Go to step 3.	Replace the HPS with new one.
3	**INTERLOCK SWITCH ACTUATING MECHANISM** 1. Remove the Link Interlock Switch & Cam Interlock Switch. 2. Inspect the Actuator Interlock Switch, Cam Actuator, Spring Cam, and Link Interlock Switch for disengagement or breakage. 3. Also check the Interlock Switch by a Digital Multi Meter. -Is there continuity between terminals 1 and 2 of the Interlock Switch when you press the hinged arm of the Interlock Switch? If not, replace the HPS. -Reinstall the Actuator Assembly Interlock Switch replacing broken parts with new one, if any. Does this error message still appear?	Replace the C258MAIN Board.	Problem solved.

1.6 ERROR MESSAGE "EXITING PAPER JAM"

Check if this error message appears even if no paper Jam in the paper exit section has been occured.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Actuator-exit and Sensor Exit • Actuators Exit-2L/2S and Sensor Exit-2 • C258MAIN Board		
1	**ACTUATOR-EXIT AND SENSOR EXIT** • Does the Actuator-exit move smoothly? • Is the output level of the Sensor Exit at CN226-2 on the C258MAIN change when you actuate the actuator-exit?	Go to step 2.	Replace the Sensor Assembly Photo Exit.
4	**ACTUATOR EXIT-2L/2S AND SENSOR EXIT-2** • Do the Actuators Exit-2L/2S move smoothly? • Is the output level of the Sensor Exit 2 at CN226-5 change when you actuate the actuator exit-2L/2S?	Replace the C258MAIN Board.	Replace the Sensor Photo.

1.7 ERROR MESSAGE "PAPER JAM"

Check if this message appears even if no paper jam over the Sensor Registration or between the Sensor Registration and the Sensor Exit has been occured.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this procedure, replace each component listed below, one at a time, until the problem disappears. • Roll Registration Assembly and Roll Pinch Registration • Fuser Assembly • Actuator-Exit and Sensor Exit • Drive Assembly Main • Drive Assembly-F/P • PWBA Hotaru • C258MAIN Board		
1	Does the jammed sheet of paper reach the Sensor Exit?	Go to step 2.	Go to step 3.
2	**ACTUATOR-EXIT AND SENSOR EXIT** • Does the Actuator-exit move smoothly and have a spring action return? • Is the output level of the Sensor Exit at CN226-2 on the C258MAIN change when you actuate it?	Replace the C258MAIN Board.	Replace the Sensor Assembly Photo Exit.
3	**PAPER CONDITION** Is the paper in the Paper Cassette or MBF wrinkled or damp?	Replace the paper with fresh, dry paper.	Go to step 4.

Step	Actions and Questions	Yes	No
4	**PAPER SIZE AND WEIGHT** Are the size and weight of the paper used within the paper specification?	Go to step 5.	Use paper within the specification.
5	**DRIVE ASSEMBLY MAIN** Does the Main Motor run and do the gears of the Drive Assembly rotate normally?	Go to step 6.	Replace the Drive Assembly Main.
6	**ROLL ASSEMBLY REGISTRATION** • Is the Roll Pinch Registration in place and pressed against the Roll Registration Assembly by the Spring Nip Registration? • Is the Roll Registration Assembly clean and free of damage or excessive wear?	Go to step 7.	Reseat the Roll Pinch Registration or replace the Roll Assembly Registration.
7	**ACTUATOR REGISTRATION** Does the Actuator Registration move freely, with a slight spring-action return?	Go to step 8.	Correct the problem, or replace the Actuator if the problem cannot be corrected.
8	**SENSOR REGISTRATION ON HPS** Is the output level of the Sensor Registration at CN221-21 change when you press the Actuator?	Replace the C258MAIN Board.	Go to step 9.
9	**PWBA HOTARU** 1. Remove the PWBA Hotaru (RRP 7.2.1). 2. Check for continuity between P21-B6 and P31-B8. Is there continuity between P21 and P31?	Replace HPS.	Replace the PWBA Hotaru.
10	**DETACK SAW** Inspect the Detack Saw. Is the Detack Saw clean and free of contamination?	Go to step 11.	Clean the Detack Saw.
11	**ROLL FUSER** 1. Remove the Fuser Assy. 1. Rotate the Fuser Drive Gear. Does the Roll Fuser rotate smoothly?	Go to step 12.	Replace the Fuser Assy.
12	**ROLL-PRESS** Rotate the Roll-Press. Does the Roll-Press rotate smoothly?	Go to step 13.	Replace the Roll-Press or Bearing-Pressure Roll.
13	**ROLL ASSEMBLY EXIT AND ROLL-PINCH** Do the Roll Assembly Exit and Roll-Pinch rotate smoothly?	Go to step 14.	Replace the Fuser Assy.
14	**GUIDE L** (Slidably held on the left side of the Frame between the Mirror Assembly and the Roll Assembly Exit) Does the Roll Fuser drive gear rotate when you press down on the Guide L?	Go to step 15.	Replace the Drive Assembly-F/P.
15	**EXIT GUIDE LINK ACTUATOR** • Locate the Guide Link actuator tab that is molded on the Cover Assembly Exit. Is the actuator tab in place on the Cover Assembly Exit; not damaged nor deformed? • Slowly close the Cover Assembly Exit and observe the actuator tab. Does the actuator tab press down on the Guide Link?	Run test prints.	Replace the Cover Assembly Exit.

1.8 ERROR MESSAGE “INSERT IMAGING CRTG”

Check if this error message is displayed even if the imaging cartridge is already installed in the printer.

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • PWBA Hotaru • C258MAIN Board		
1	Remove and reinstall the imaging Cartridge. Does this error message still appear?	Go to step 2.	Problem solved.
2	Reseat the HPS to make sure that the conductor strips for applying the voltages of the HPS to the BCR, Magnet Roll, and BTR are in complete contact with the corresponding conductors on the HPS. Does this error message still appear?	Go to step 3.	Problem solved.
3	PWBA HOTARU (PL7.2.4) 1. Remove the PWBA Hotaru. 2. Check for the continuity between: P21-A9 andP31-A5 P21-A10 and P31-A4 P21-A11 and P31-A3 P21-B7 and P31-B7 P21-B8 and P31-B6 P21-B9 and P31-B5 P21-B10 and P31-B4 P21-B11 and P31-B3 P21-B13 and P31-B1 Is there continuity between P21 and P31?	Go to step 4.	Replace PWBA Hotaru.
4	**C258MAIN Board** Replace the C258MAIN Board. Does this error message still appear?	Replace the HPS.	Problem solved.

1.9 ERROR MESSAGE “INSERT LC1”

This error message is displayed when the printer detects that the upper Paper Cassette is not in place. If this error message is displayed though the upper Paper Cassette is installed, locate and eliminate sources of the problem following the procedure below.

Step	Actions and Questions	Yes	No
	S**USPECT COMPONENTS** The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Paper Cassette • Size Switches on the Sensor Assembly-Size 1 • C258MAIN Board		
1	**PAPER CASSETTE** Inspect the Actuator that are located on the side of the Paper Cassette. IS the Actuator intact, not chipped nor broken?	Go to step 2.	Replace the Paper Cassette with new one.
2	**SIZE SWITCHES** • Do the Size Switches function correctly? • Is the signal level at CN224-9 change when you press and release each prong of the Spring Size?	Replace the C258MAIN Board.	Replace the Senor Assembly Size-1.

3.2.2 Troubleshooting with Printer Operation

2.1 PRINTER DOES NOT OPERATE PROPERLY

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • No recommendations		
1	**AC POWER CORD** Inspect the AC Power Cord. Is the AC Power Cord plugged into the back of the printer, and is the other end plugged into an AC wall outlet?	Go to step 2.	Connect the AC Power Cord to the printer, and plug it into a wall outlet.
2	**AC POWER** Check the voltage at the wall outlet. Is there approximately 110 VAC (or 220 VAC for the 220 VAC model) at the AC wall outlet?	Go to step 3.	Troubleshoot the AC power at the wall outlet for a possible tripped breaker or open circuit.
3	**+24VDC POWER SUPPLY** 1. Remove the C258MAIN. 1. Slide the PWBA Hotaru out about an inch so it disconnects from the HPS. 1. Switch ON Main Power. 1. Inspect the Fan IOT. Is the Fan rotating?	Go to step 5.	Go to step 4.
4	**+24VDC POWER SUPPLY** 1. Slide the PWBA Hotaru out about an inch so it disconnects from the HPS. 2. Disconnect the Fan IOT from P/J222. 3. Switch ON Main Power. 4. Check the voltage between P/J222-3 and P/J222-1. Is there +24VDC between P/J222-3 and P/J222-1?	Go to step 5.	Replace the HPS.
5	**+5 VDC POWER SUPPLY** 1. Remove the C258MAIN. 2. Check the voltage between: P31-A10 and FG P31-A11 and FG P31-B11 and FG **Is there +5VDC between P31 and FG?** Note: Since there is no convenient test point on the HPS to check for +5VDC, this step has you check four separate +5VDC voltages that run from the HPS through the PWBA Hotaru and on to the C258MAIN through J31. Although not a foolproof test, it should give you some indication of whether or not the +5VDC portion of the HPS is working correctly. Failure to read +5VDC on any of the test points most likely reflect a HPS failure, but in some cases an PWBA Hotaru failure may give you the same readings.	Go to step 6.	Replace the HPS
6	**PWBA HOTARU** 1. Remove the C258MAIN. 2. Check the voltages between: P31-A10 and FG P31-A11 and FG P31-B11 and FG Is there +5VDC between P31 and FG?	Go to step 7.	Replace the PWBA Hotaru.

Step	Actions and Questions	Yes	No
7	**HPS** 1. Remove Cover Assembly Main. 2. Disconnect J222 of the Fan IOT from the HPS. 3. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 8	Replace HPS.
Note: Steps 8 through 16 attempt to isolate a faulty component that might be loading down the Power Supply.			
8	C258MAIN Board 1. Reinstall the C258MAIN leaving all the connectors disconnected. 2. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG. Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 9.	Replace the C258MAIN Board.

Step	Actions and Questions	Yes	No
9	**DRIVE ASSEMBLY MAIN** 1. Reconnect J27 of the Main Motor to CN227 of the C258MAIN. 2. Check the voltages between: CN231-A10 <=> FG CN231-A11 <=> FG CN231-B11 <=> FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 10.	Replace the Drive Assembly Main.
10	**ROS ASSEMBLY** 1. Reconnect J23 to CN223 of the C258MAIN. 2. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 11.	Replace the ROS Assembly.

Step	Actions and Questions	Yes	No
11	**SOS ASSEMBLY** 1. Reconnect J22 to CN222 of the C258MAIN. 2. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1. Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 12.	Replace the Mirror Assembly.
12	**SOLENOID EXCHANGE** 1. Reconnect J25 to CN225 of the C258MAIN. 2. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 13.	Replace the Solenoid Exchange.

Step	Actions and Questions	Yes	No
13	**SENSOR ASSEMBLY-SIZE 1** 1. Reconnect J24 to CN224 of the C258MAIN. 2. Check the voltages between: CN231-A10 <=> FG CN231-A11 <=> FG CN231-B11 <=> FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 14.	Replace the Sensor Assembly- Size 1.
14	**SENSOR ASSEMBLY TEMPERATURE** 1. Reconnect J28 to CN228 of the C258MAIN. 1. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1 Is there +24VDC between P/J222-1 and P/J222-3?	Go to step 15.	Replace the Sensor Assembly Temperature.
15	**SENSOR PHOTO AND SENSOR ASSEMBLY PHOTO EXIT** 1. Reconnect J26 to CN226 of the C258MAIN. 2. Check the voltages between: CN231-A10 and FG CN231-A11 and FG CN231-B11 and FG Is there +5VDC between CN231 and FG? 1. Check the voltage between P/J222-3 and P/J222-1. Is there +24VDC between P/J222-1 and P/J222-3?	Check for other wirings.	Replace the Sensor Photo or the Sensor Assembly Photo Exit.

2.2 ABNORMAL PRINT OPERAITON

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this procedure, replace each component listed below, one at a time, until the problem disappears. • No recommendations		
1	Does the printer enter a print cycle?	Go to step 3.	Go to step 2.
2	**+5 VDC POWER SUPPLY** 1. Remove the C258MAIN. 2. Check the voltage between: P31-A10 and FG P31-A11 and FG P31-B11 and FG **Is there +5VDC between P31 and FG?** Note: Since there is no convenient test point on the HPS (PL7.1.2) to check for +5VDC, this step has you check four separate +5VDC voltages that run from the HPS through the PWBA Hotaru and on to the C258MAIN through J31. Although not a foolproof test, it should give you some indication of whether or not the +5VDC portion of the HPS is working correctly. Failure to read +5VDC on any of the test points most likely reflect a HPS failure, but in some cases an PWBA Hotaru failure may give you the same readings.	Go to step 3.	Replace the HPS.
3	**C258MAIN Board** Execute Status Sheet printing. Can the printer generate a test print?	Go to step 4.	Replace the C258MAIN.
4	Does the printer still exhibit erratic operation?	Go to step 5.	Problem solved.
5	Replace the C258MAIN. Does the printer still exhibit erratic operation?	Go to step 6.	Problem solved.
6	Execute Status Sheet printing. Does the printer reset while making a test print?	Go to Electrical Noise.	-----

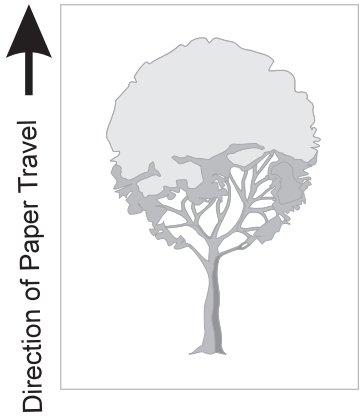
2.3 ELECTRICAL NOISE

Step	Actions and Questions	Yes	No
	SUSPECT COMPONENTS The following components are associated with this specific problem. One or more of these components may have failed partially or completely. If you cannot isolate the problem using this FIP, replace each component listed below, one at a time, until the problem disappears. • Duplex Unit • Lower Cassette Unit • Drive Assembly Main • Solenoid Feed • Solenoid MBF		
1	**EXTERNAL NOISE** 1. Check if there is other electrical equipment, such as electrical generators, radio transmitters, or devices using electrical motors, near the printer. 2. Shut off the other electrical equipment, or relocate the printer away from the other devices. Is the electrical noise problem still present?	Go to step 2.	Permanently relocate either the printer or the problem devices.
2	**AC GROUND** Check the AC wall outlet. Is the AC wall outlet correctly wired and grounded?	Go to step 3.	Repair the AC wall outlet.
3	**IMAGING CARTRIDGE** Replace the Imaging Cartridge. Is the electrical noise problem still present?	Go to step 4.	Problem solved.
4	**PLATE CONTACTS** Inspect Plate-Heat Roll and Plate Contacts RTN, CR, BTR, DB, and DTS. Are all of these Plate Contacts in place, not bent or deformed, and does each Plate Contact make secure contact with the associated HPS terminal (DB, CR, etc.)?	Go to step 5.	Repair the damaged Plate Contact.
5	**HPS** Replace the HPS. Is the Electrical Noise problem still present?	Go to step 6.	Problem solved.
6	**C258MAIN Board** Replace the C258MAIN. Is the Electrical Noise problem still present?	Go to step 7.	Problem solved.
7	**Fuser Assy.** Replace the Fuser Assembly. Is the Electrical Noise problem still present?	Go to other suspect Components.	Problem solved.

3.2.3 Troubleshooting with Print Image Quality

This section describes the checkpoints for troubleshooting the printer by referring the print image quality.

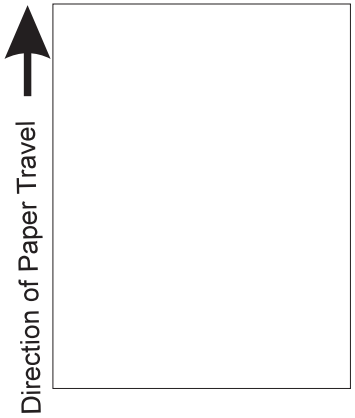
3.1 LIGHT (UNDERTONE) PRINT

Problem	Suspect Components
The overall image density is too light.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Plate Contact CR • Plate Contact DB • Plate Contact BTR • Plate Contact DTS • Plate Contact RTN

Step	Action and Question	Yes	No
1	Print test image. Is the test print image normal?	Go to Step 2.	Go to Step 3.
2	Check and correct the print density setting with the panel setting mode (Config. Menu). Does the problem still persist?	Replace the C258MAIN with a known good one.	Problem solved.
3	1. Print test image and turn off the printer halfway through the print cycle. 2. Carefully remove the Imaging Cartrigde and inspect the toner image created on the OPC drum surface just before the transfer area (the area which comes into contact with the BTR Roll). Is the toner image on the OPC drum sharp and black in the normal density?	Go to Step .8	Go to Step 4.
4	Install a new Imaging Cartridge and print test image. Is the print image normal?	Problem solved.	Go to Step 5.
5	**HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL** 1. Reform the plate contacts CR, DB and RTN so they make better contacts with the Bias Charge Roll, Magnet Roll, Drum and with the terminals on the HPS. 2. Print test image. Is the test print quality normal?	Problem solved.	Go to Step 6.
6	**HPS** 1. Replace the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	-----
7	**PAPER CONDITION** Is the paper damp?	Replace with dry paper.	Go to Step 11.

Step	Action and Question	Yes	No
8	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image quality normal?	Problem solved.	Go to Step 9.
9	**HPS OUTPUT VOLTAGE TR TO BTR** 1. Reform the Plate Contact BTR so it makes better contact with the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 9.
10	**HPS** 1. Replace the HPS. 2. Print test image. 3. Is the print image quality normal?	Problem solved.	Go to Step 11.
11	**BTR** 1. Replace the Roll Assy. BTR. 2. Print test image. Is the print image quality normal?	Problem solved.	-----

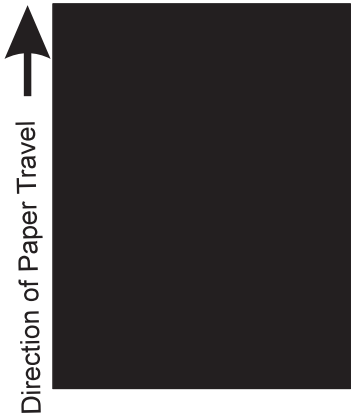
3.2 BLANK PRINT (NO IMAGE)

Problem	Suspect Components
The entire page is blank.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Plate Contact CR • Plate Contact DB • Plate Contact BTR • Plate Contact DTS • Plate Contact RTN • PWBA Hotaru • C258MAIN Board

Step	Action and Question	Yes	No
1	Print test image. Is the test print image normal?	Go to Step 2.	Go to Step 3.
2	C258MAIN BOARD Replace the C258MAIN with a known good one. Does the problem still persist?	Go to Step 4.	Problem solved.
3	1. Print test image and turn off the printer halfway through the print cycle. 2. Carefully remove the Imaging Cartrigde and inspect the toner image created on the OPC drum surface just before the transfer area (the area which comes into contact with the BTR Roll). Is the toner image formed on the OPC drum surface?	Go to Step .	Go to Step .
4	Install a new Imaging Cartridge and print test image. Is the print image normal?	Problem solved.	Go to Step 5.
5	**HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL** 1. Reform the plate contacts CR, DB and RTN so they make better contacts with the Bias Charge Roll, Magnet Roll, Drum and with the terminals on the HPS. 2. Print test image. Is the density of print image normal?	Problem solved.	Go to Step 6.
6	**PAPER CONDITION** Is the paper damp?	Replace with dry paper.	Go to Step 7.
7	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image quality normal?	Problem solved.	Go to Step 8.

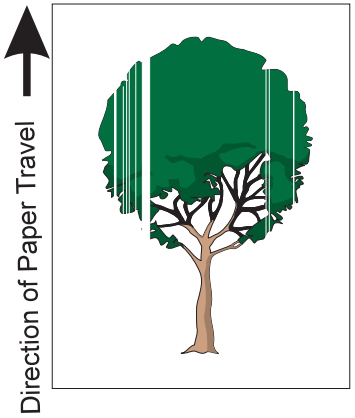
Step	Action and Question	Yes	No
8	**HPS OUTPUT VOLTAGE TR TO BTR** 1. Reform the Plate Contact BTR so it makes better contact with the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 9.
9	**HPS** 1. Replace the HPS. 2. Print test image. 3. Is the print image quality normal?	Problem solved.	Go to Step 10.
10	**BTR** 1. Replace the Roll Assy. BTR. 2. Print test image. Is the print image quality normal?	Problem solved.	-----

3.3 BLACK PRINT

Problem	Suspect Components
The entire page is black.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Plate Contact CR • Plate Contact DB • Plate Contact BTR • Plate Contact DTS • Plate Contact RTN • PWBA Hotaru • C258MAIN Board

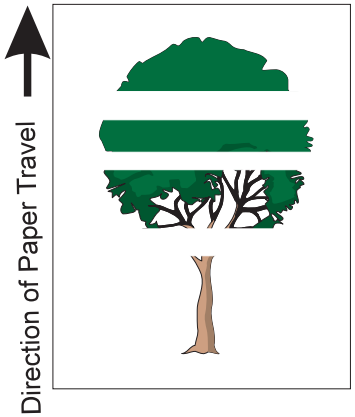
Step	Action and Question	Yes	No
1	Print test image. Is the test print image normal?	Go to Step 2.	Go to Step 3.
2	C258MAIN BOARD Replace the C258MAIN with a known good one. Does the problem still persist?	Go to Step 4.	Problem solved.
3	Install a new Imaging Cartridge and print test image. Is the print image normal?	Problem solved.	Go to Step 4.
4	**HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL** 1. Reform the plate contacts CR, DB and RTN so they make better contacts with the Bias Charge Roll, Magnet Roll, Drum and with the terminals on the HPS. 2. Print test image. Is the density of print image normal?	Problem solved.	Replace the HPS.

3.4 VERTICAL WHITE BANDING

Problem	Suspect Components
There are areas of the image that are extrreamly light or missig entirely. These missing areas form wide ands that runs vertically along the paper feeding direction.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Mirror Assy. • Fuser Assy. • Imaging Cartridge

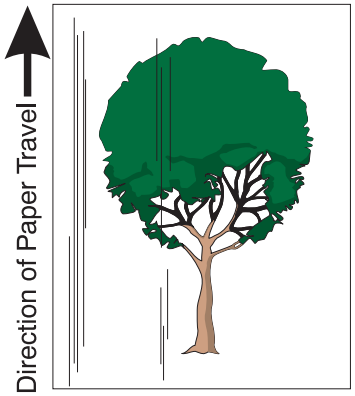
Step	Action and Question	Yes	No
1	PAPER CONDITIONS Is the paper damp?	Replace with dry paper.	Go to Step 2.
2	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 3.
3	LASER BEAM PATH inspect the Mirror Assy. and the laser beam path between the ROS Assy. and the OPC drum. • Is a surface of the Mirror Assy. clean? • Is the laser beam path free of any obstruction?	Go to Step 4.	Clean a surface of the Mirror Assy. or remove any ostructions from laser beam path.
4	ROLL BTR Inspect the Roll BTR for contamination and wear. Is the Roll BTR free of contamination and wear?	Go to Step 5.	Replace the Roll Assy. BTR.
5	PAPER PATH] Inspect the paper path throughly for any contamination and wear. Is the paper path clean and free of obstaruction?	Go to Step 6.	Clean or remove any obstruction from the paper path.
6	ROLL FUSER AND ROLL PRESS 1. Remove the Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these Rolls free of scratches and contamination?	Go to suspect component.	Replace the Roll Fuser or the Roll Press.

3.5 HORIZONTAL WHITE BANDING

Problem	Suspect Components
There are areas of the image that are extrreamly light or missig entirely. These missing areas form wide ands that runs horizontally across the paper.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Plate Contact CR • Plate Contact DB • Plate Contact BTR • Plate Contact DTS • Plate Contatct RTN • Imaging Cartridge • PWBA Hotaru • C258MAIN Board

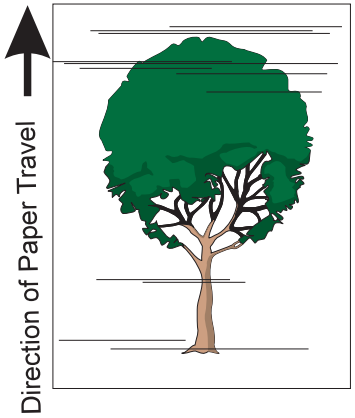
Step	Action and Question	Yes	No
1	PAPER CONDITIONS • Is the paper damp? • Is the paper wrinkled?	Replace with new, dry paper.	Go to Step 2.
2	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 3.
3	HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL 1. Reform the plate contacts CR, DB and RTN so they make better BCR, Magnet Roll, OPC Drum and the terminals on the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 4.
4	HPS 1. Replace the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 5.
5	HPS OUTPUT VOLTAGE TR TO BTR 1. Reform the plate contact BTR so it makes better contact with the terminal on the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 6.
6	HPS 1. Replace the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	-----

3.6 VERTICAL BLACK STREAKS

Problem	Suspect Components
There are black lines runs vertically along the paper feeding direction.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Fuser Assy. • Imaging Cartridge

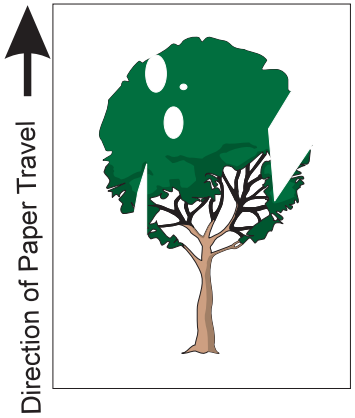
Step	Action and Question	Yes	No
1	PAPER PATH Inspect the entire paper path for any obstruction or contamination. Is the paper path free of obstruciton and contamination?	Go to Step 2.	Clean contamination or remove obstruction in the paper path.
2	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 3.
3	ROLL FUSER AND ROLL PRESS 1. Remove the Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these Rolls free of scratches and contamination?	Go to “Electrical Noise”.	Replace the Roll Fuser or the Roll Press.

3.7 HORIZONTAL BLACK STREAKS

Problem	Suspect Components
There are areas of the image that are extrreamly light or missig entirely. These missing areas form wide ands that runs horizontally across the paper.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Plate Contact CR • Plate Contact DB • Plate Contact BTR • Plate Contact DTS • Plate Contatct RTN • Imaging Cartridge • PWBA Hotaru • C258MAIN Board

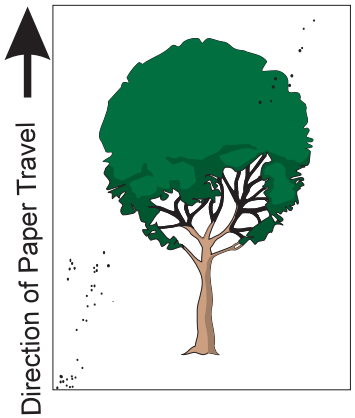
Step	Action and Question	Yes	No
1	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 2.
2	**HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL** 1. Reform the plate contacts CR, DB and RTN so they make better BCR, Magnet Roll, OPC Drum and the terminals on the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 3.
3	**HPS** 1. Replace the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 4.
4	**ROLL FUSER AND ROLL PRESS** 1. Remove Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these rolls free of scratches and contamination?	Go to “Electrical Noise”.	Replace the Roll Fuser or the Roll Press.

3.8 WHITE SPOT

Problem	Suspect Components
There are areas of the image that are extrreamly light or missig entirely. These missing areas form spots that are localized to small area of the page  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Roll BTR • Fuser Assy. • Imaging Cartridge

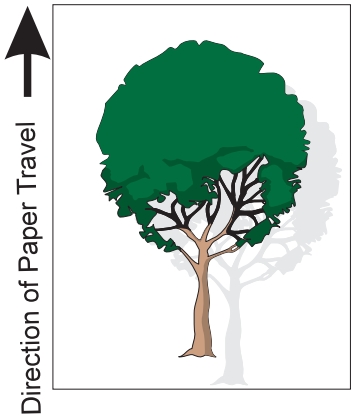
Step	Action and Question	Yes	No
1	PAPER CONDITIONS • Is the paper damp? • Is the paper wrinkled?	Replace with a new, dry paper.	Go to Step 2.
2	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 3.
3	ROLL BTR Inspect the Roll BTR for contamination and wear. Is the Roll BTR free of contamination and wear?	Go to Step 4.	Replace the Roll Assy. BTR.
4	ROLL FUSER AND ROLL PRESS 1. Remove the Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these Rolls free of scratches and contamination?	Go to suspect component.	Replace the Roll Fuser or the Roll Press.

3.9 BLACK SPOT

Problem	Suspect Components
There are spots of toner randomly scattered over the page.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Fuser Assy. • Imaging Cartridge • PWBA Hotar • C258MAIN Board

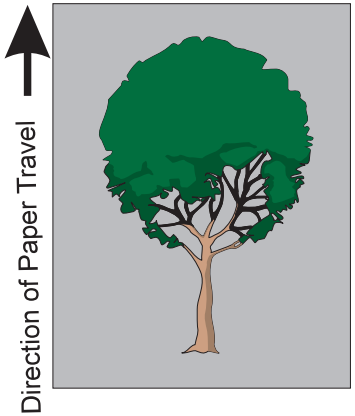
Step	Action and Question	Yes	No
1	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 2.
2	ROLL FUSER AND ROLL PRESS 1. Remove the Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these Rolls free of scratches and contamination?	Go to suspect component.	Replace the Roll Fuser or the Roll Press.

3.10 GHOST PRINT

Problem	Suspect Components
There are ghost image appeared on the image. The image may be either ghosts of the previously printed page or the part of the image being printed on the current page.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • No recommendation

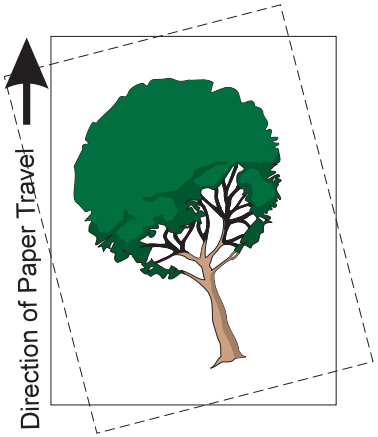
Step	Action and Question	Yes	No
1	REPETITIVE PRINTING Inspect the ghost image. Was the user printing numerous copies of the same image?	Go to Step 2.	Go to Step 3.
2	Print 30 pages of various images. Do ghost image still appear?	Go to Step 3.	Problem solved. Avoid printing the same image for many copies.
3	IMAGING CARTRIDGE Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 4.
4	ROLL FUSER AND ROLL PRESS 1. Remove the Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these Rolls free of scratches and contamination?	Go to suspect component.	Replace the Roll Fuser or the Roll Press.

3.11 DIRTY BACKBROUND

Problem	Suspect Components
There is toner contamination on all or part of the page. The contamination appears as a very light gray dusting.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Fuser Assy. • Imaging Cartridge • PWBA Hotaru • C258MAIN Board

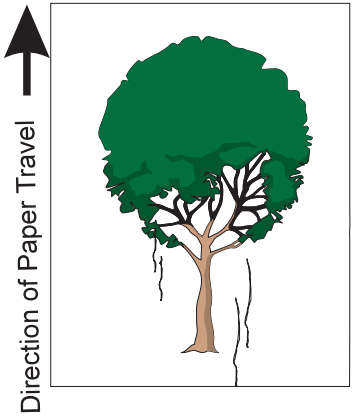
Step	Action and Question	Yes	No
1	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image normal?	Problem solved.	Go to Step 2.
2	**HPS OUTPUT VOLTAGES CR AND DB TO BCR AND MAGNET ROLL** 1. Reform the plate contacts CR, DB and RTN so they make better BCR, Magnet Roll, OPC Drum and the terminals on the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 4.
3	**HPS** 1. Replace the HPS. 2. Print test image. Is the print image quality normal?	Problem solved.	Go to Step 4.
4	**ROLL FUSER AND ROLL PRESS** 1. Remove Fuser Assy. 2. Inspect the Roll Fuser and the Roll Press for scratches and contamination. Are these rolls free of scratches and contamination?	Go to suspec component.	Replace the Roll Fuser or the Roll Press.

3.12 SKEWED PRINTING

Problem	Suspect Components
The image is not parallel with the paper.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Imaging Cartridge • Paper Cassette • Paper Path Rolls

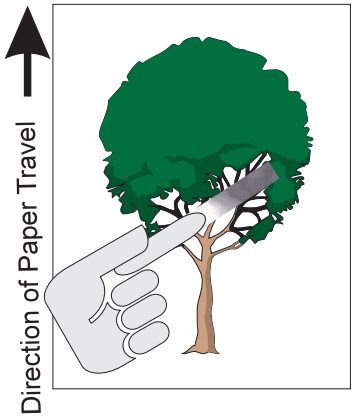
Step	Action and Question	Yes	No
1	**PAPER FEED** • Are the paper cassettes installed correctly? • Is the paper loaded into the cassette correctly?	Go to Step 2.	Reload the paper and re-install the paper cassette.
2	**PAPER PATH** Inspect the entire paper path for any ostructoion or contamination. Is the paper path free of obstruction or contamination?	Go to Step 3.	Clean or remove the obstruction in the paper path.
3	**PAPER PATH ROLLS** Inspect all rolls along the paper path for any contamination, wear or damage. Are the paper path rolls free of contamination, wear or damage?	Go to Step 4.	Replace the damaged or worn rolls to new one.
4	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image normal?	Go to suspect component.	Problem solved.

3.13 DAMAGED PRINTING

Problem	Suspect Components
The printed paper is either wrinkled, creased, or torn.  	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Fuser Assy. • Paper Cassette • Paper Path Rolls

Step	Action and Question	Yes	No
1	**PAPER FEED** • Are the paper cassettes installed correctly? • Is the paper loaded into the cassette correctly?	Go to Step 2.	Reload the paper and re-install the paper cassette.
2	**PAPER CONDITION** Is the paper damp?	Replace with new, dry paper.	Go to Step 3.
3	**PAPER PATH** Inspect the entire paper path for any ostructoion or contamination. Is the paper path free of obstruction or contamination?	Go to Step 4.	Clean or remove the obstruction in the paper path.
4	**PAPER PATH ROLLS** Inspect all rolls along the paper path for any contamination, wear or damage. Are the paper path rolls free of contamination, wear or damage?	Go to Step 5.	Replace the damaged or worn rolls to new one.
5	**FUSER ASSY.** 1. Remove the Fuser Assy. 2. Inspect the surface of Roll Fuser and Roll Press. Are the surface of rolls free of dirt or scracthes?	Go to Step 6.	Clean or replace the rolls.
6	**IMAGING CARTRIDGE** Install a new Imaging Cartridge. Is the print image normal?	Go to suspect component.	Problem solved.

3.14 UNFUSED IMAGE

Problem	Suspect Components
The image is not fully fused to the paper. The image is easy to rub off. 	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • Fuser Assy. • PWBA Hotaru

Step	Action and Question	Yes	No
1	**PAPER CONDITION** • Is the paper damp? • Is the paper wrinkled?	Replace with a new, dry paper.	Go to Step 2.
4	**FUSER ASSY** Replace the Fuser Assy. Is the print image still unfused?	Replace C258MAIN Board.	Problem solved.

3.15 MISREGISTRATION

Problem	Suspect Components
The printed is not centered on the page or is bleeding off the page.	The following components are assosiated with this specific problem. One or more of these components may have failed partially or completely. If you can not isolate the problem using this procedure, replace each components listed below, one at a time, until the problem disappears. • PWBA Hotaru • C258MAIN Board

Step	Action and Question	Yes	No
1	**PAPER CONDITION** • Is the paper damp? • Is the paper wrinkled?	Replace with new, dry paper.	Go to Step 2.
2	**PAPER FEED** Observe the paper feeding. Is the paper fed crooked?	Go to “Skewed Image”.	Go to Step 3.
3	**PAPER PATH** Inspect the entire paper path for any ostructoion or contamination. Is the paper path free of obstruction or contamination?	Go to Step 4.	Clean or remove the obstruction in the paper path.
4	**C258MAIN BOARD** Replace the C258MAIN and Print test image. Is the print image normal?	Problem solved.	-----

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 OVERVIEW

This chapter explains how to disassemble the printer and its various mechanisms. Except where otherwise indicated, the reassembly procedure is the reverse of the disassembly procedure.

4.1.1 Precautions

This section describes the precautions you must take to prevent accidents during disassembly and reassembly work. Be sure to carry out all work in accordance with the precautions and general instructions provided in this manual.

- **The following three safety switches are provided to protect against equipment breakdown or possible injury. DO NOT MODIFY THESE SWITCHES:**
  <INTERLOCK SWITCH>
  This safety switch goes OFF when the Cover Assy. Exit opens, cutting the 24V power to the control circuitry and the engine.
  <5V INTERLOCK SWITCH>
  This switch goes OFF when the Cover Assy. Exit is opened, cutting the power to the laser-diode circuit.
- **Make sure to unplug the printer before beginning disassembly.**
- **Be aware that the fuser unit remains hot for some time after the printer goes off. Allow the unit sufficient time to cool down before you touch it.**
- **Take care to avoid catching hands in movable parts (rollers, fan, etc.).**
- **Never touch conductive areas of the printer (the HPS ASSY primary side, the chassis, or the high-voltage components) while the printer is plugged in.**
- **Never remove the cover of the ROS ASSY.**

- **Be careful to avoid injury from frame edges and other sharp or protruding areas of the printer.**
- **Do not disassemble the Imaging Cartridge.**
- **Keep Imaging Cartridges away from direct sunlight.**
- **Do not disassemble the ROS ASSY.**
- **Avoid touching IC elements with bare hands, so as to prevent possible damage from electrostatic discharge. If you need to touch these areas, wear appropriate electrostatic protection gear (electrostatic wrist band, etc.).**
- **To ensure work efficiency and safety, use only the tools specified in this manual.**
- **Do not open the upper case until the main motor has come to a complete stop.**
- **Remove the Imaging Cartridge before transporting the printer.**
- **Before transporting the printer, pack it correctly into its dedicated packaging.**
- **The printer uses screws of many different types. Be sure to note the correct location for each screw before removing it. Inserting screws into the wrong places may strip or damage the screw holes.**

4.1.2 Tools

The following table lists the tools you need to disassemble and reassemble the printer.

Table 4-1. Required Tools

Tool	Market Availability	Code
Phillips screwdriver	Yes	B743800200
Tweezers	Yes	B641000100
Round nose pliers	Yes	B740400100

4.1.3 Pre-Shipment Check

Before shipping the printer back to customer following completion of maintenance or repair, you should at a minimum check the operations indicated the table below to ensure that work has been carried out correctly and that the printer is functioning as it should.

Table 4-2. Pre-Shipment Check List

Type	Funciton	Checkpoints	OK?
Operation	Control Panel	Confirm that LCD, LEDs and buttons are working correctly.	
	Fuser ASSY	Does the heater lamp light up correctly?	
	Status Shet Printing	• Is outpur normal? • Is print quality normal?	
	Data Printing	Conform normal printing in all modes. (PCL, ESC/P2, FX, I239X)	
	Firmware Version	Version is :	
Cleaning	-	Confirm that inside and outside of the printer are clean.	
Packing	-	Confirm that Imaging cartdige has been removed from the printer.	

4.1.4 Special Operaiton for Service

The table below lists the special operation that can be activated by turning on the printer while holds down specified button(s) on the control panel.

The specified combination of button(s) are need to be kept pressed until the RAM check completes, to properly activates the special operation.

Table 4-3. Special Operation

Item	Button(s)	Description
Hex-Dump Mode	Form Feed	Prints all received data in Hexadecimal format. The printed sheet contains the following information: • ASCII character list in Hexadecimal format • 1-byte character corresponding to a received data (unreadble character code is expressed by “.”(period)) • Page number Printng is made according to the factory default print settings except; I/F selection, Power-save mode, Paper size, Toner-save, Duplex printing. This mode can be cancelled by the Warm-boot sequence (Alt+Continue) or power Off/On of the printer.
Initialize EEPROM	• Online • Continue • Menu	Set 00H to all address of EEPROM to clear all setting including the toltal page count and write the factory default settings. After the reset operation, the printer performs warm-boot sequence and returns to normal state.
Initialize panel settings	Continue	Reset all panel settings of the common menu and each I/F setting menu to the factory defaults. The settings which the user cannot define directly, such as the total page count, are not initialized. After the initialization, the printer performs warm-boot sequence and returns to normal state.
Clear Total Page Count	• Online • Menu • Item	Reset the total page count value to zero (0). After the reset operation, the printer performs warm-boot sequence.

Item	Button(s)	Description
Force-erase the Flash-ROM module	• Alt • Item • Value • Enter	Erase all data in the Flash-ROM module installed in slot-A. The erase operation starts when the LCD message is changed to “Erase DIMM A”. After completing erase operation, the printer performs warm-boot and returns to normal state.
Update Program ROM	• Online • Alt • Value	Update the contents of ROM module installed in the program ROM slot. 1. Connect the PC to the printer with a parallel I/F. 2. Enter the mode. 3. The LCD panel displays a message “Program Device..” for 3 seconds and changed to a message “Version 00.02 ..” for another 3 seconds. 4. The LCD panel message is changed to “Please Send Data” and wait for the data transfer from the connected PC. If you turn off the printer at this point, the update operation is cancelled and the contents of program ROM module remains unchanged. 5. Transfer the new program ROM data file from the PC to the printer in BINARY transfer mode. The LCD panel message is changed to “OLD:xxxxx NEW:xxxx” and goes to stand-by state. 6. Press Enter button to continue the update operation, or pressing MENU button to display a message “WAIT RESET” and discard received data (the contents of program ROM module remains unchanged). 7. When Enter button is pressed, a message “Erasing Device” is displayed and all the contents of ROM module are being erased. Once this message is displayed, the contents of ROM module cannot be recovered. 8. After completing the data erase, the printer is writing the received data to the ROM module, and while writing the data, a message “PRG xxxxxxxx” is displayed on the LCD panel. 9. When completing the data write, a check-sum value is displayed on the LCD panel as “xxxx, xxxx, xxxx, xxxx”. 10. Press Enter button and a message “O.K:Please Reboot” appear on the LCD. Press Enter button again to start rebooting the printer and the printer become ready state.
Copy ROM Module	• Online • ALT • Enter	Copy the contents of ROM module installed in slot-B to a Flash-ROM module installed in slot-A. If slot-B is vacant, the contents of ROM module in program socket are copied instead. 1. Enter the mode. 2. When a message “DIMM COPY MODE” is displayed, press Enter button to continue and a data copy starts after erasing the contents of target ROM module. 3. When data copy complete, the printer perform warm-boot sequence and returns to normal state.
Toner Counter Reset	• Online • Form Feed	Reset the toner counter value to “E■■■■F”.
Maintenance Mode	• Online • Form Feed • Continue	A menu item “Maintenance Menu” will be added as a menu item. With the EPL-N1600, an item “Reset Roller” will be added and this function is used to initialize the position of pick up roller in the MP Tray and the paper cassette in order to prevent possible paper jam at the power on.

4.2 DISASSEMBLY AND ASSEMBLY

This section explains how to disassemble the printer to access its main components. Except where otherwise indicated, the reassembly procedure is the reverse of the disassembly procedure. The following flowchart show the disassembly flow.

4.2.1 Cover Side,E

1. Remove the upper Paper Cassette.
2. Tilt back the Duplex Vertical Unit, if the optional Duplex Unit is installed.
3. Press the release button and open the Cover Exit,E.
4. Remove the two screws (1) that are located at the rear of the Cover Side,E.
5. Release the hook on the interior surface of the top side of the Cover Side by pulling the edge of the top side (2) up, and then pull the Cover Side away from the printer.
6. Release a latch that is located on the interior surface of the top side of the Cover Side by pulling the bottom part of the front side to the front and then to the left (toward you) (3).
7. Pull the Cover Side off of the printer (4).

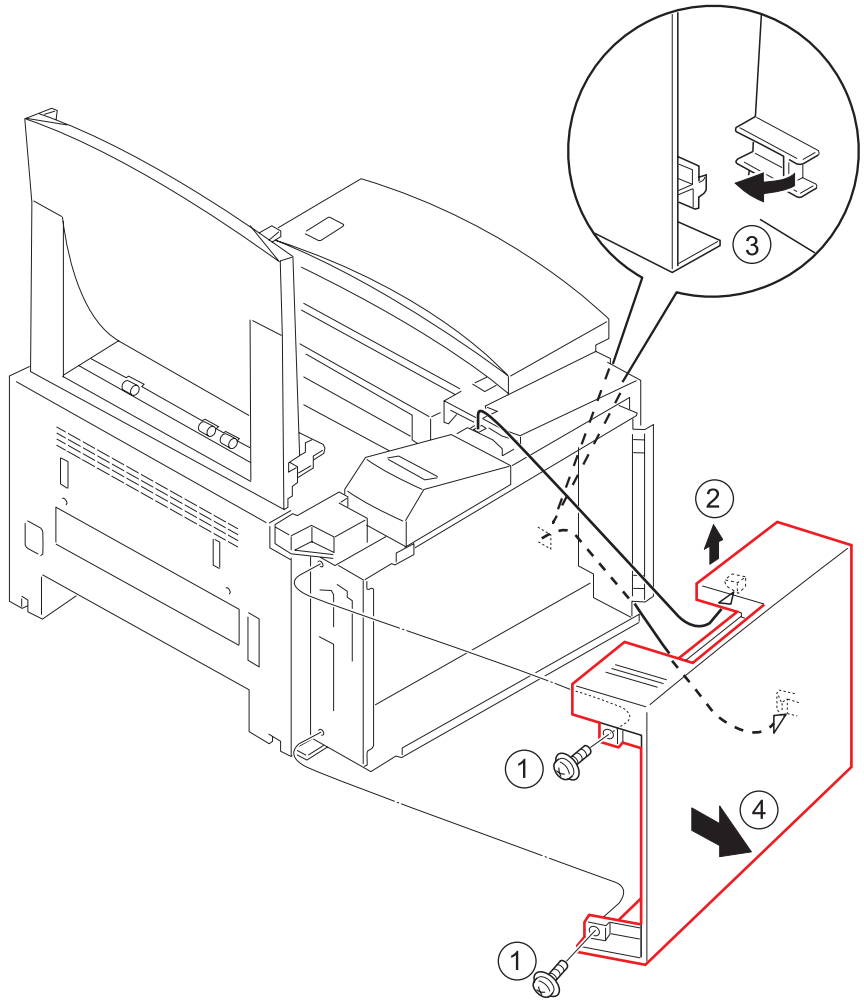


Figure 4-1. “Cover Side, E” Removal

4.2.2 Shield Assembly Top.ST

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the four screws that secure the Shield Assembly Top.ST to the Cover Side.
3. Remove the Shield Assembly Top.

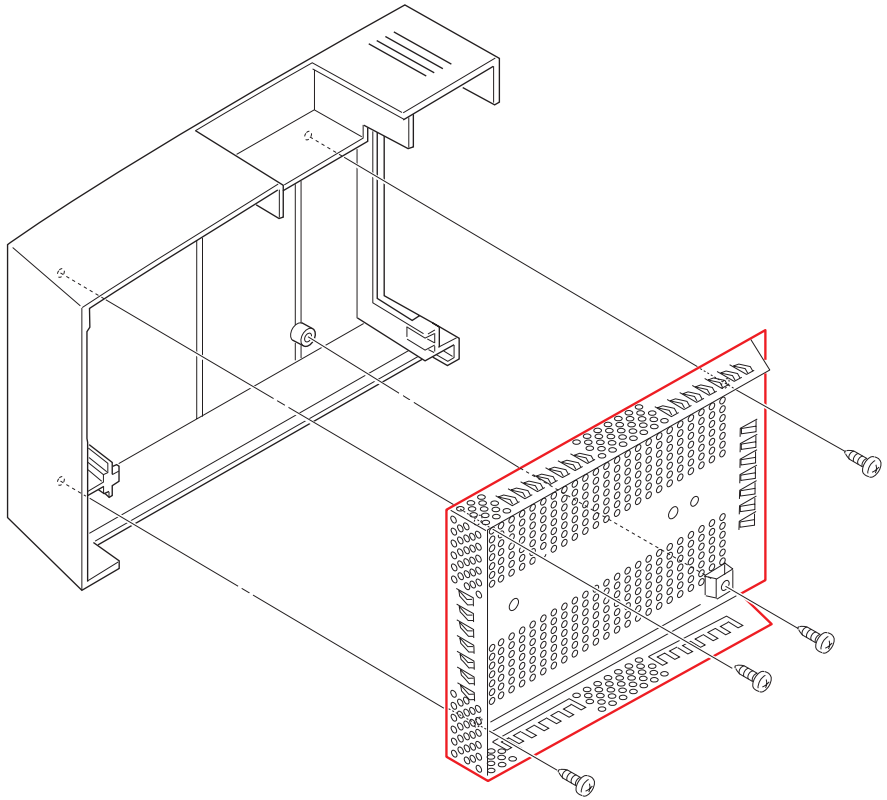


Figure 4-2. “Shield Assembly Top.ST” Removal

4.2.3 Control Panel

1. Remove the Cover Side,E. (Section 4.2.1)
2. Disconnect CN9 from the C258MAIN Board.
3. Remove the screw that secures the Control Assembly Panel (E) to the Cover Assembly,E.
4. Remove the Control Panel, passing the CN9 harness out of the Shield Assembly Bottom (E) through the cutout in the top side of the Shield Assembly Bottom (E).

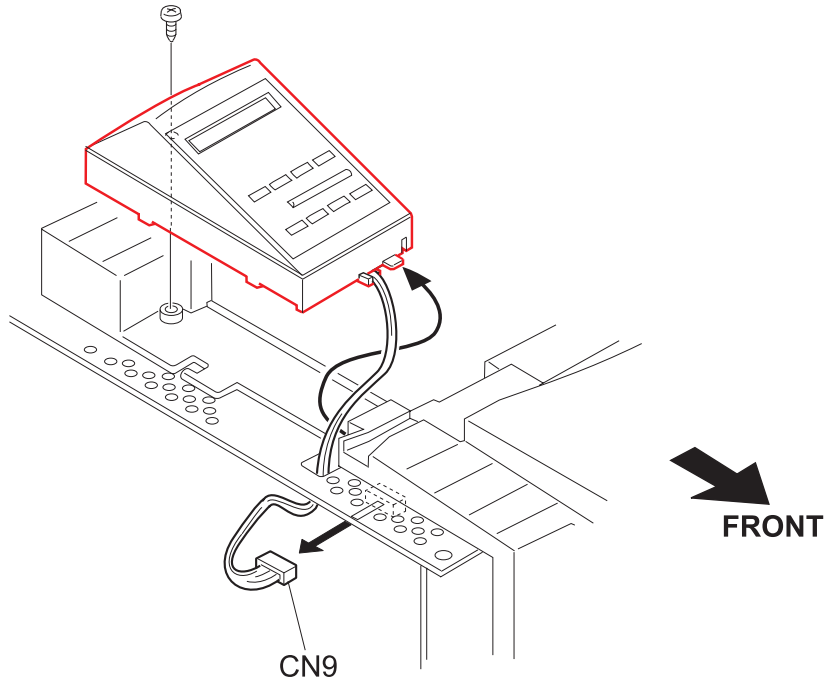


Figure 4-3. “Control Panel” Removal

4.2.4 Cover Assembly MBF.E

1. Open the Cover Assembly MBF.E. (Section 4.2.1)
2. Press out on the left pivot of the Frame MBF until the left pivot bracket slides free of the pivot.
3. Slide the right pivot bracket free, and remove the Cover Assembly MBF.E.

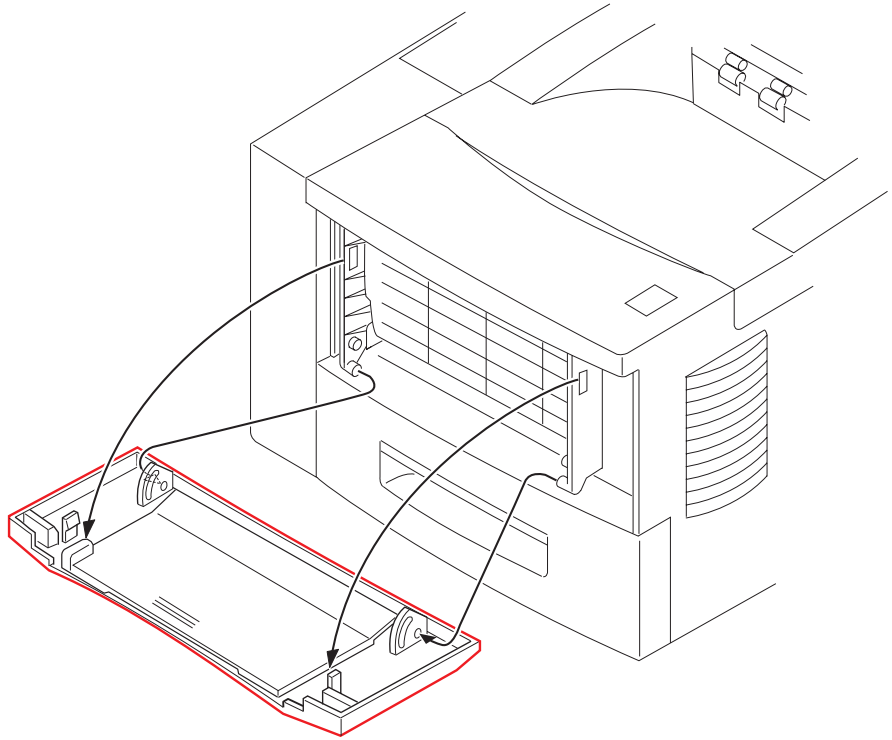


Figure 4-4. “Cover Assembly MBF.E” Removal

4.2.5 Tray Assembly MBF.E

1. Remove the Cover Assembly MBF.E. (Section 4.2.4)
2. Open the Tray Assembly MBF.E.
3. Press out on the left side of the Frame MBF and free the left side of the Tray Assembly MBF.
4. Free the right side of the Tray Assembly MBF and remove the Assembly.

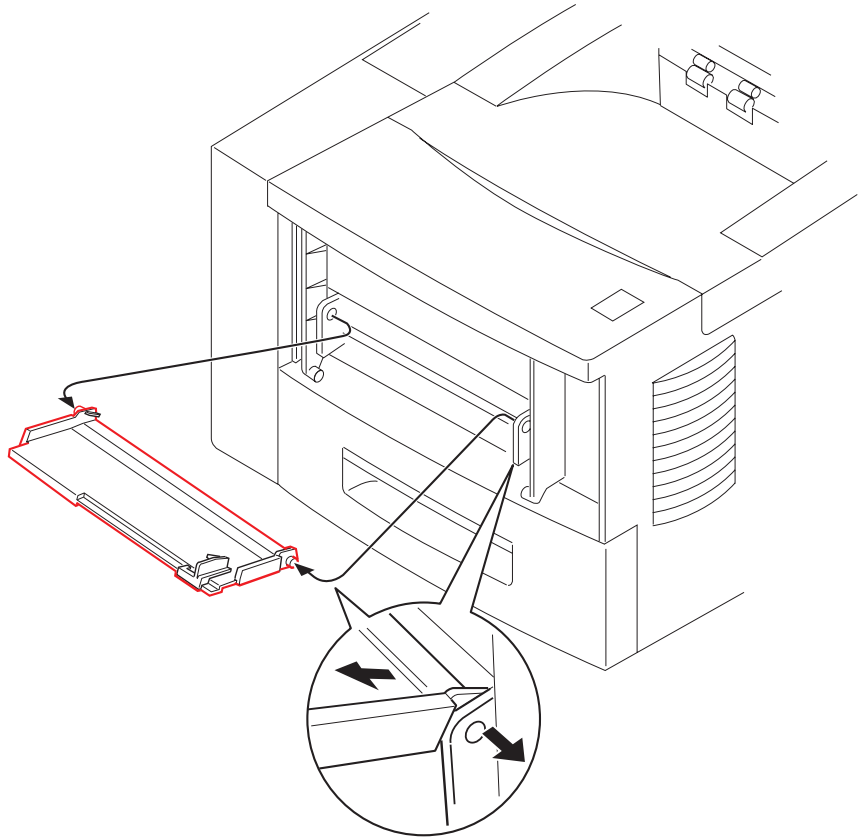


Figure 4-5. “Tray Assembly MBF.E” Removal

4.3 Cover Assembly,E

1. Remove the Duplex Unit if installed.
2. Remove the Cover Side,E. (Section 4.2.1)
3. Remove the Control Assembly Panel (E). (Section 4.2.3)
4. Remove the Cover Assembly MBF.E. (Section 4.2.4)
5. Remove the Tray Assembly MBF.E. (Section 4.2.5)
6. Loosen the two screws that are located at the front of the Cover Assembly,E.
7. Remove the two screws that are located at the rear of the Cover Assembly,E.
8. Open the Cover Exit,E
9. Remove the two screws that are located on the top of the Cover Assembly,E.
10. Lift the Cover off of the Printer Frame pulling the bottom end of the Cover Assembly,E below the Printer Power Switch away from the Printer Frame to make the edge of the switch hole in the Cover pass over the Printer Power Switch (1).

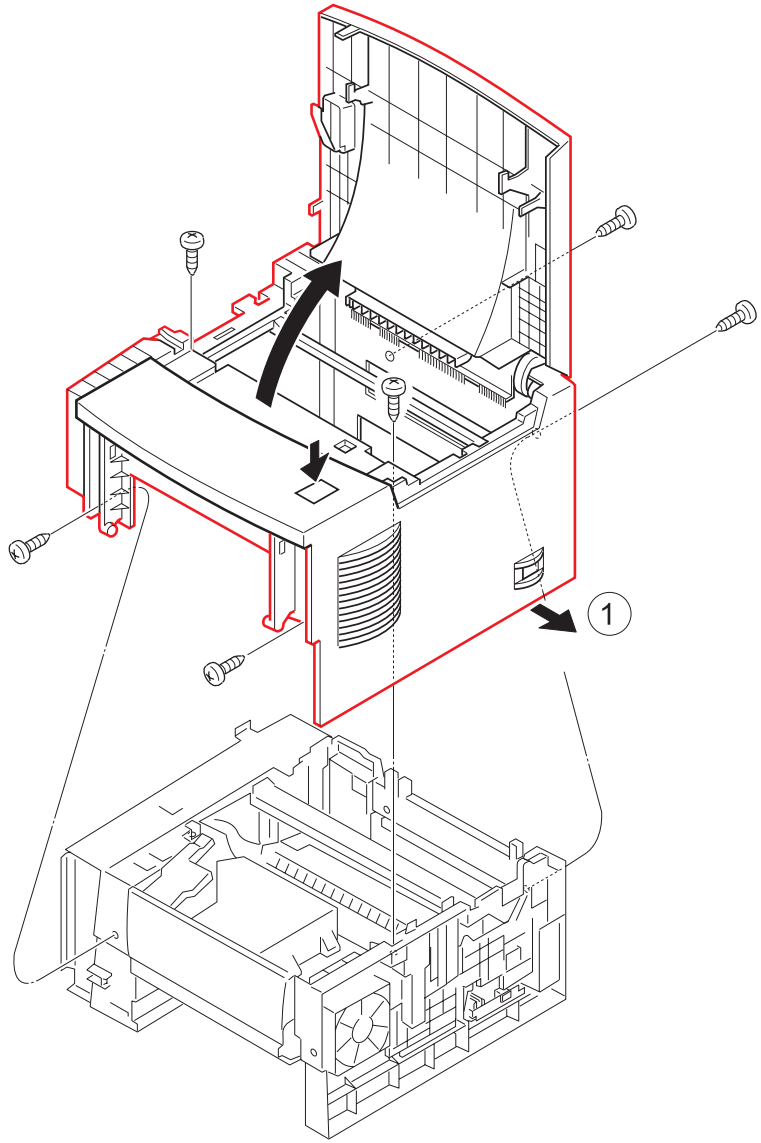


Figure 4-6. “Cover Assembly, E” Removal

4.3.1 Cover Assembly Exit,E

1. Remove the Cover Side, E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E. (Section 4.2.4)
4. Remove the Tray Assembly MBF.E. (Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Set the Cover Assembly,E on its rear surface.
7. Remove the three screws that secure the Bracket Hinge,E to the Cover Assembly,E.
8. Carefully manipulate the Cover Exit,E to move the Bracket Hinge away from the mount toward you and then raise the right side of the Cover Exit to tilt the Cover Exit (1).

CHECK POINT

Be careful not to damage the strip conductor laid by the Bracket Hinge.

9. Shift the Cover Exit to the right to get the pivot on the left arm out of the pivot hole on the left side of the Cover Main (2).
10. Take the Cover Exit out of the Cover Assembly,E (3).

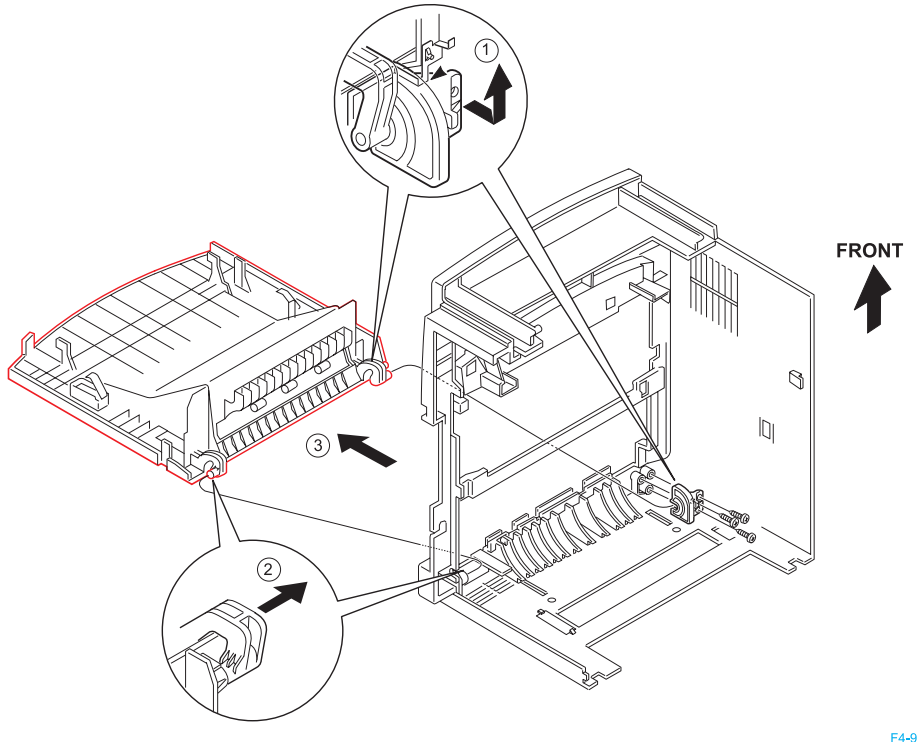


Figure 4-7. “Cover Assembly Exit,E” Removal

4.3.2 Sensor Assembly-Size 1,E

1. Remove the Cover Side, E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E. (Section 4.2.4)
4. Remove the Tray Assembly MBF.E. (Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board. (Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Set the printer on its rear side.
9. Remove the PWBA Hotaru.
10. Disconnect P/J236-1 (Harness Assembly MBF) and P/J234-2 (Harness Solenoid) located at the left side of the ROS Assembly, and route the Harness Assembly MBF and the Harness Solenoid out of the Frame (1).
11. Push the Sensor Assembly-Size 1,E downward while pressing the latching tab in the rectangular hole located near the J24 harness by a small screwdriver blade (2).

CHECK POINT

The latch tab is in contact with the rear side wall (lower side wall when the printer is set on the rear side) of the access hole. Press the latch tab until it disengages from the side wall of the rectangular hole.

12. Take the Sensor Assembly-Size 1,E out of the Printer Frame.
13. Disconnect P234 and P236 from the Sensor Assembly Size-1,E.

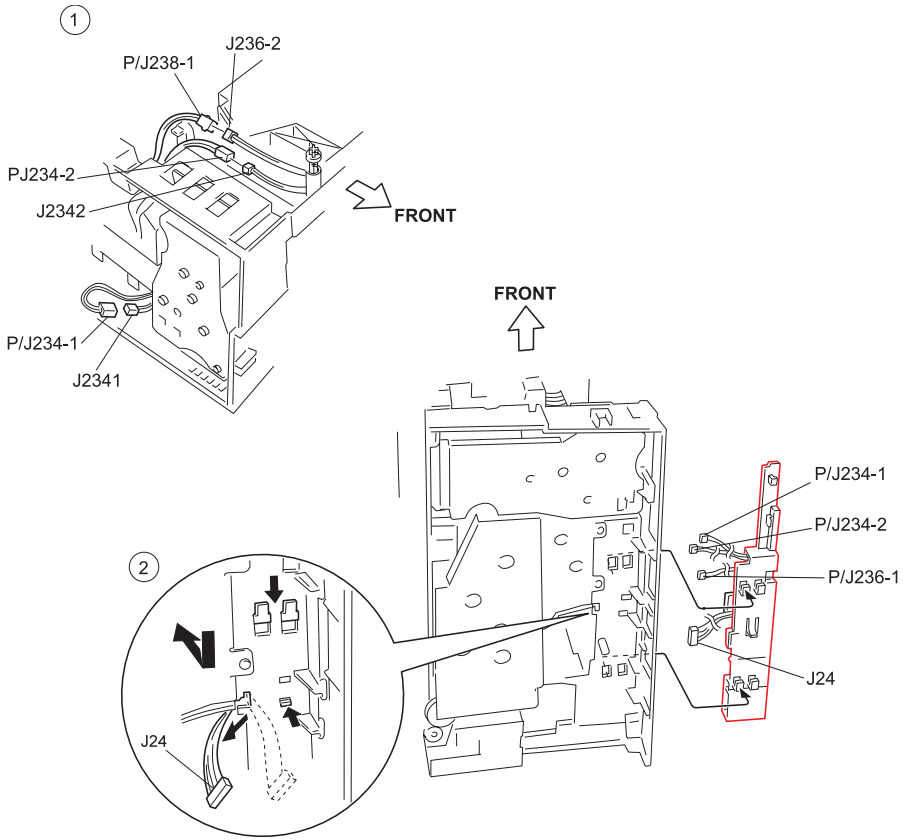


Figure 4-8. "Sensor Assembly Size 1,E" Removal

4.3.3 Drive Assembly

1. Remove the Cover Side,E.(Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E.(Section 4.3)
6. Remove the C258MAIN Board. (Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the PWBA Hotaru. (Section 4.3.48)
9. Remove the Chassis Assembly PS. (Section 4.3.46)
10. Remove the wire harness from the Drive Assembly front plate (5).
11. Disconnect J2341 on the wire harness from the Solenoid Feed from P234-1 on the wire harness from the Sensor Assembly-Size 1,E.
12. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
13. Remove the Frame Assembly MBF.
14. Set the printer on the rear surface.
15. Remove the Roll Assembly Feed (2 and 3).
16. Remove the Actuator No Paper (4).
17. Return the printer to an upright position.
18. Remove the four screws that secure the Drive Assembly to the Frame.
19. Remove the Drive Assembly off of the Frame.
20. Slide the Roll Assembly Turn off of their shaft by pressing the latch.

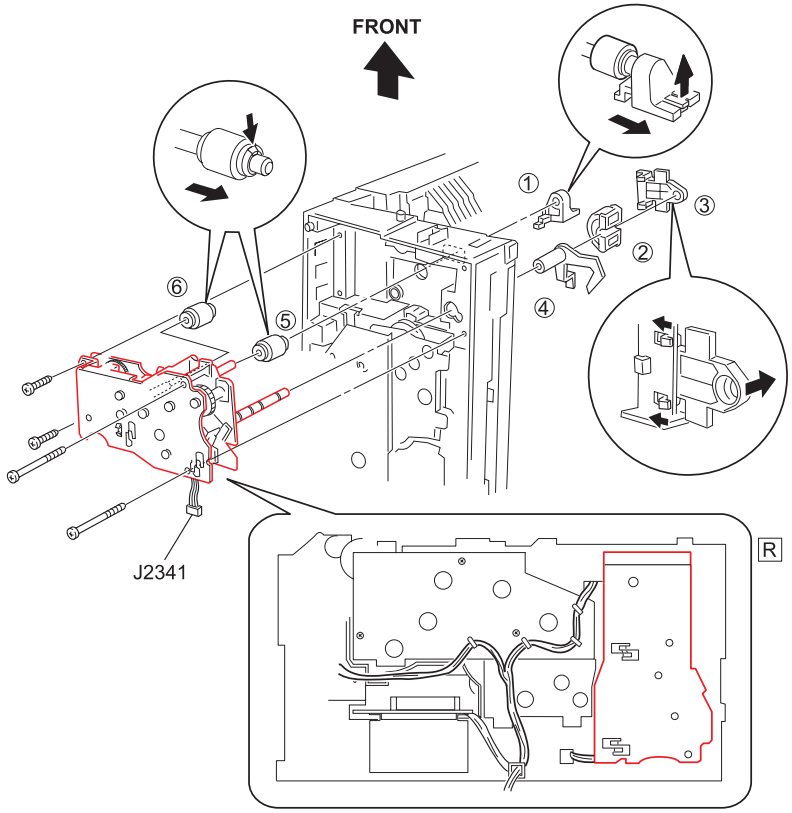


Figure 4-9. “Drive Assembly” Removal

4.3.4 Solenoid Feed

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E. (Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E.(Section 4.3)
6. Remove the C258MAIN Board. (Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the wire harness from the Drive Assembly front plate.
9. Remove the four screws that secure the Drive Assembly front plate (2).
10. Squeeze together the latch clips that retain the front plate and pull the front plate away from the Drive Assembly gears. After the front plate becomes free of the gear shafts, lift it up to make the inner arm of the front plate clear the large gear (3).
11. Slide the large gear (3) off of the shaft so that you can access the Solenoid Feed.
12. Disconnect J2341 (on the Solenoid Feed wire harness) from P234-1 (on the wire harness from the Sensor Assembly-Size 1,E).
13. Remove the screw that secures the Feed Solenoid and take the Solenoid out of the Drive Assembly.

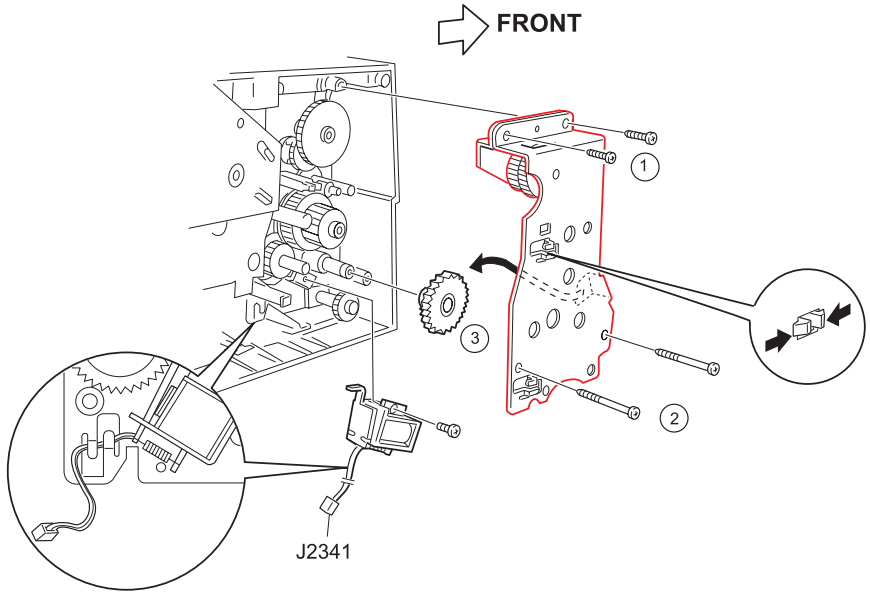


Figure 4-10. “Solenoid Feed” Removal

4.3.5 Chute Inlet Registration

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the ROS Assembly. (Section 4.3.37)
7. Remove the Latch R and L.(Section 4.3.50)
8. Remove the Shaft Latch. (Section 4.3.51)
9. Remove the six screws that secure the Angle to the Printer Frame.
10. Remove the Angle, along with the attached Chute Inlet Registration, from the Printer Frame.
11. Remove the two screws that secure the Chute Inlet Registration to the Angle and separate the Chute from the Angle.
12. Remove the screw that secures the Plate Earth Chute to the Angle and separate the Plate Earth Chute from the Angle.

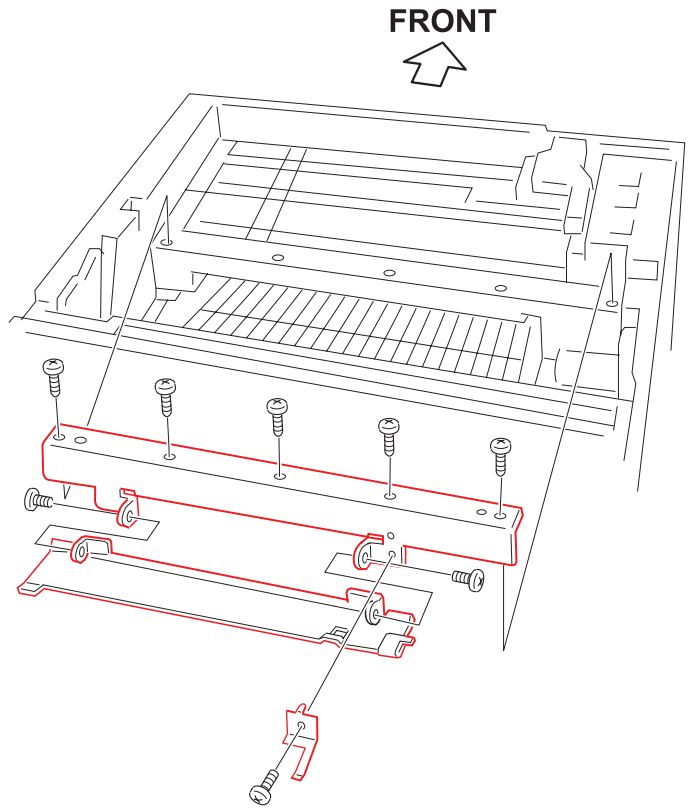


Figure 4-11. “Chute Inlet Registration” Removal

4.3.6 Roll Assembly Registration

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the two screws that secure the Roll Assembly Registration to the Printer Frame.
7. Lift the Roll Assembly Registration out of the printer.

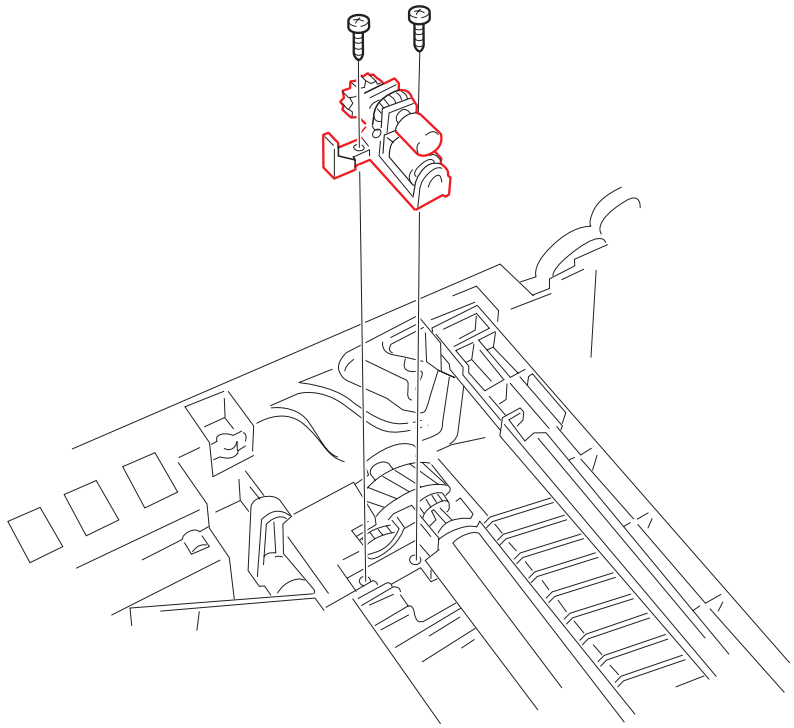


Figure 4-12. “Roll Assembly Registration” Removal

4.3.7 Roll Assembly Feed

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
8. Remove the PWBA Hotaru.(Section 4.3.48)
9. Remove the Chassis Assembly PS. (Section 4.3.46)
10. Set the printer on the rear surface.
11. Press the Roll Assembly Feed to slide it to the right on the shaft.
12. Press on the flat side of the Roll Assembly Feed away from the shaft.

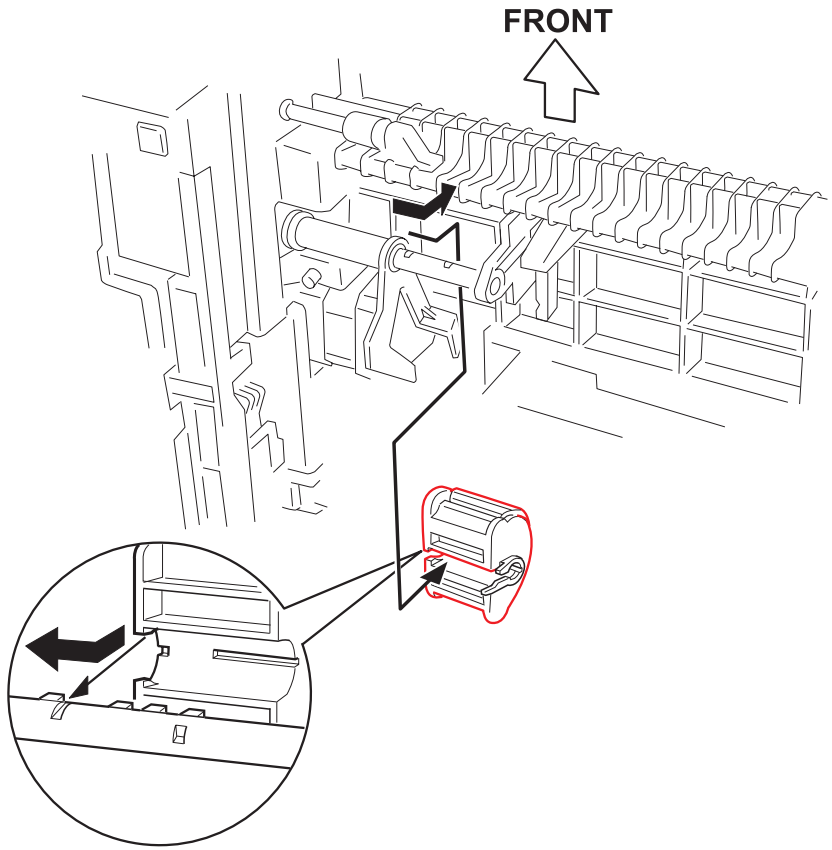


Figure 4-13. “Roll Assembly Feed” Removal

4.3.8 Actuator No Paper

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
8. Remove the PWBA Hotaru(Section 4.3.48)
9. Remove the Chassis Assembly PS. (Section 4.3.46)
10. Set the printer on the rear surface.
11. Remove the Roll Assembly Feed.
12. Press the Bearing Feed away from the Roll Assembly Feed to pull off the latches (1) at the bottom part of the Bearing Feed. Then, tilt the Bearing Feed away from the shaft as far as it can go, manipulate it to disengage the hook (2) at the bottom, and remove it.
13. Turn the Actuator No Paper around the shaft to line up the groove in the inside surface of the Actuator with a stopper projection on the shaft (3), and slide the Actuator off of the shaft.

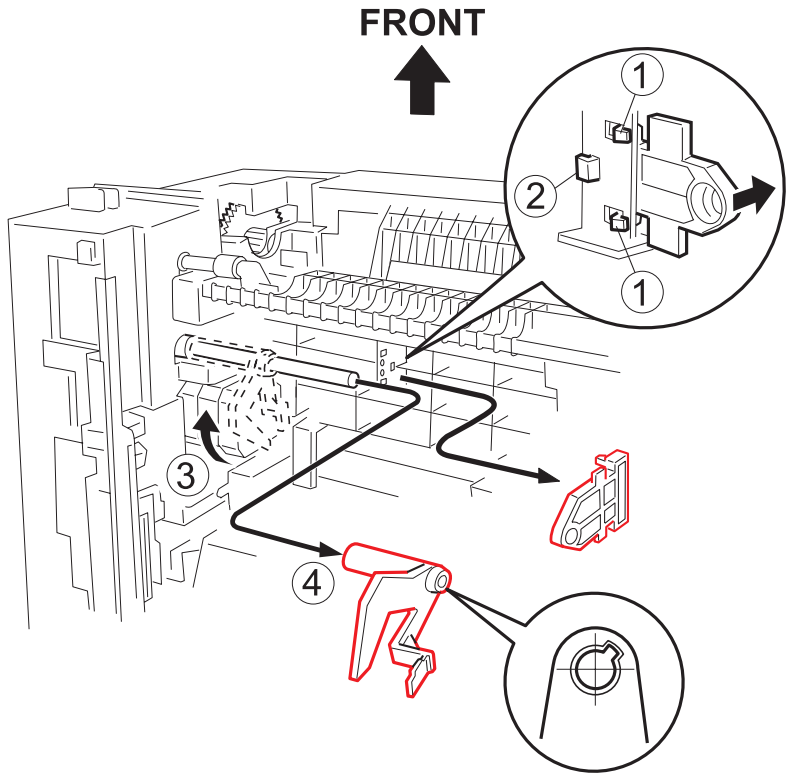
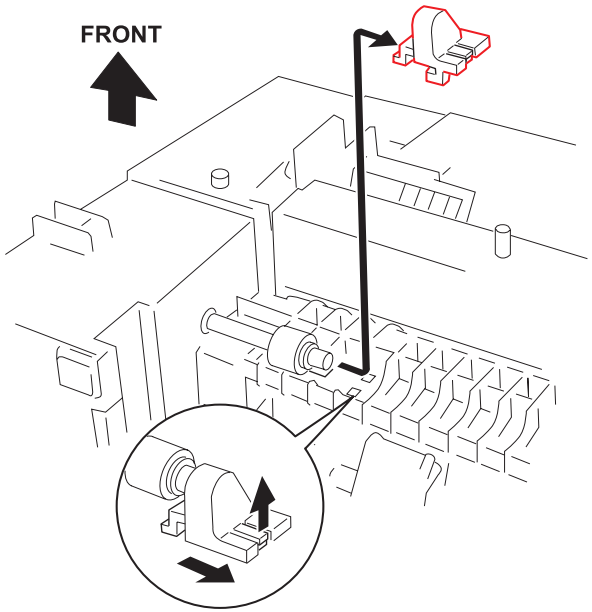


Figure 4-14. “Actuator No Ppaer” Removal

4.3.9 Roll Assembly Turn

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Set the Printer Frame on its rear surface.
7. Press the Bearing Turn to the right while prying up the latch by the tip of a small screwdriver.
8. Press the latch on the shaft, and slide the Roll Assembly Turn off of the shaft.



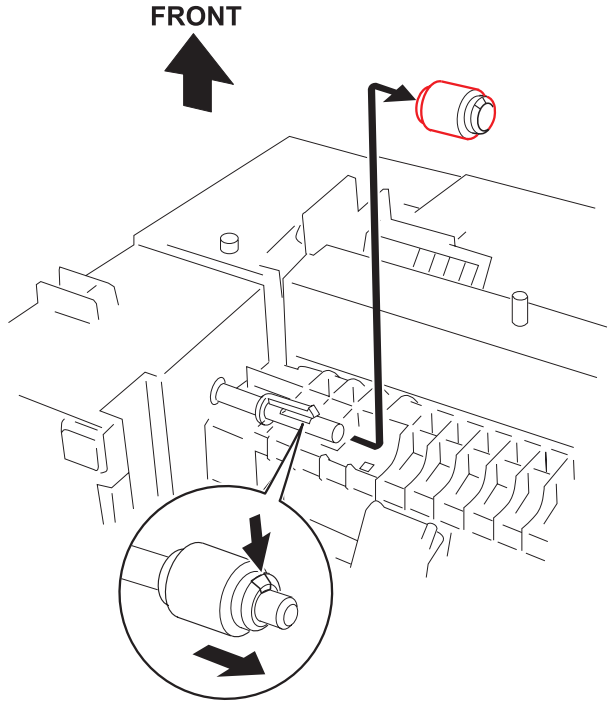


Figure 4-15. “Roll Assembly Turn” Removal

4.3.10 Actuators Pre-Registration A and B

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod and Spring Nip Pre-Registration (steps 6 and 7 of PL4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the C258MAIN Board.(Section 4.3.49)
9. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
10. Remove the PWBA Hotaru.(Section 4.3.48)
11. Remove the Chassis Assembly PS.(Section 4.3.46)
12. Remove the Roll Assembly Feed.(Section 4.3.7)
13. Remove the Actuator No Paper.(Section 4.3.8)
14. Remove the Drive Assembly-F/P.(Section 4.3.42)
15. Remove the Drive Assembly Main.(Section 4.3.43)
16. Remove the Drive Assembly.(Section 4.3.3)
17. Remove the Sensor Toner if installed.
18. Remove the Kit Chute Registration Assembly. (Section 4.3.11)
19. Pull the right end (spring-loaded end) of Actuator Pre-Registration B (PL3.1.19: one with the longer shaft) out of the retaining opening in the right mounting post, and slide the Actuator off of the hole in the left mounting post.
20. Pull the Actuator Pre-Registration A out of the retaining opening in the mounting posts.

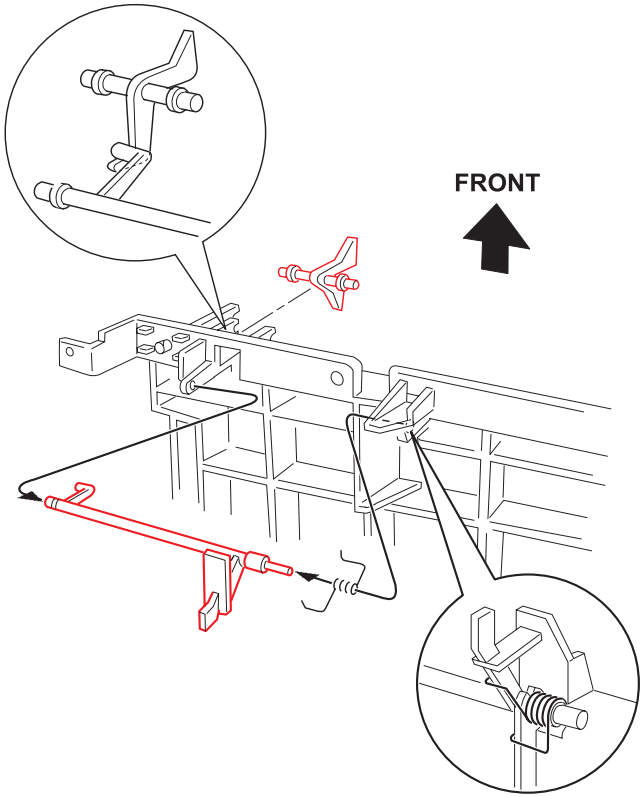


Figure 4-16. “Actuator Pre-Registration A” Removal

4.3.11 Kit Chute Registration Assembly

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
8. Remove the PWBA Hotaru.(Section 4.3.48)
9. Remove the Chassis Assembly PS.(Section 4.3.46)
10. Remove the Roll Assembly Feed.(Section 4.3.7)
11. Remove the Actuator No Paper.(Section 4.3.8)
12. Remove the Drive Assembly-F/P. (Section 4.3.42)
13. Remove the Drive Assembly Main. (Section 4.3.43)
14. Remove Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration.
15. Remove the Frame Assembly MBF. (Section 4.3.19)
16. Remove the Drive Assembly.(Section 4.3.3)
17. Remove the Sensor Toner if installed.
18. Set the Printer Frame on its rear surface.
19. Press together the hook of the Chute Rib and push up the Rib upward (to the front).
20. Remove the five screws that secure the Kit Chute Registration Assembly to the Printer Frame.
21. Pull a little the left side of the Kit Chute Registration Assembly and hold on the air, then pull right side carefully with the Link Interlock Switch skidding to the left, and finally take the Kit Chute Registration Assembly out of the Printer Frame.

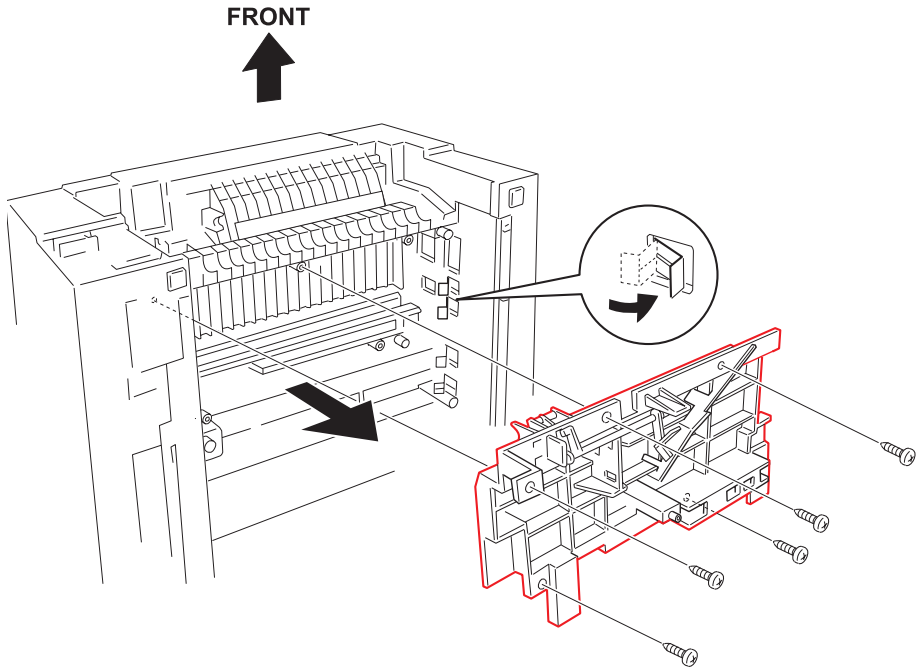


Figure 4-17. “Kit Chute Registration Assembly” Removal

4.3.12 Actuator Registration

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove C258MAIN Board.(Section 4.3.49)
9. Remove Shield Assembly Bottom (E).(Section 4.3.44)
10. Remove PWBA Hotaru.(Section 4.3.48)
11. Remove the Chassis Assembly PS.(Section 4.3.46)
12. Remove the Roll Assembly Feed.(Section 4.3.7)
13. Remove the Actuator No Paper.(Section 4.3.8)
14. Remove the Drive Assembly-F/P.(Section 4.3.42)
15. Remove the Drive Assembly Main.(Section 4.3.43)
16. Remove the Drive Assembly.(Section 4.3.3)
17. Remove the Sensor Tone if installed.
18. Remove the Kit Chute Registration Assembly. (Section 4.3.11)
19. Pull the Actuator Registration, along with the Spring Sensor Registration, out of the retaining holes in the mounting posts on the Printer Frame.

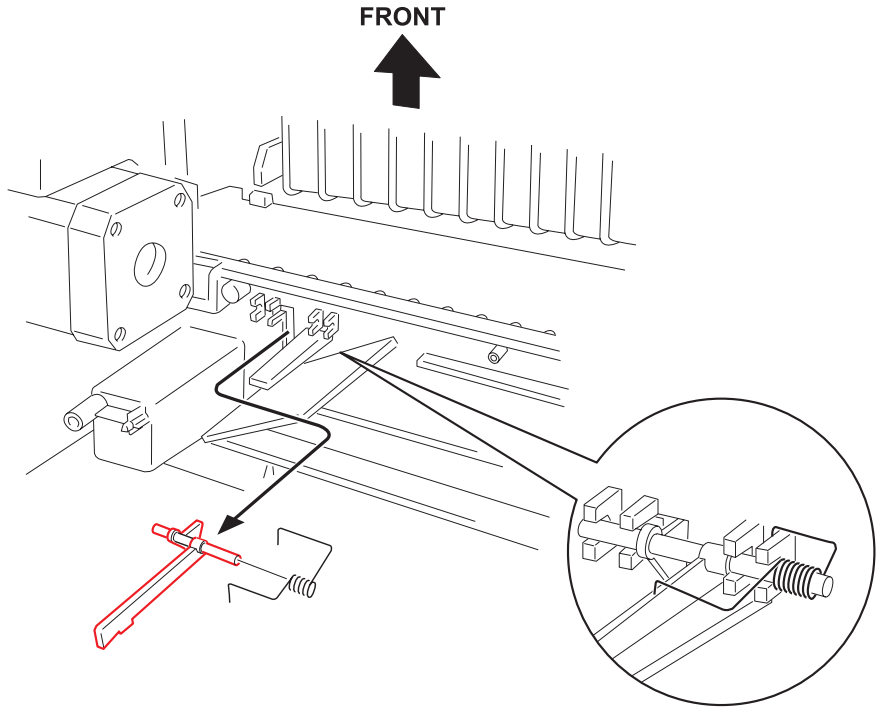


Figure 4-18. “Actuator Registration” Removal

4.3.13 Link Interlock Switch and Cam Interlock Switch

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the C258MAIN Board.(Section 4.3.49)
9. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
10. Remove the PWBA Hotaru.(Section 4.3.48)
11. Remove the Chassis Assembly PS.(Section 4.3.46)
12. Remove the Drive Assembly-F/P.(Section 4.3.42)
13. Remove the Drive Assembly Main.(Section 4.3.43)
14. Remove the Sensor Toner if installed.
15. Remove the Roll Assembly Feed.(Section 4.3.7)
16. Remove the Actuator No paper.(Section 4.3.8)
17. Remove the Drive Assembly.(Section 4.3.3)
18. Remove the Kit Chute Registration Assembly. (Section 4.3.11)
19. Pull the Cam Interlock Switch off of the retaining slots.
20. Press down the stopper tab on the Link Interlock Switch and slide the Link Interlock Switch to the left out of the guide on the Kit Chute Registration Assembly Kit Chute Registration Assembly.

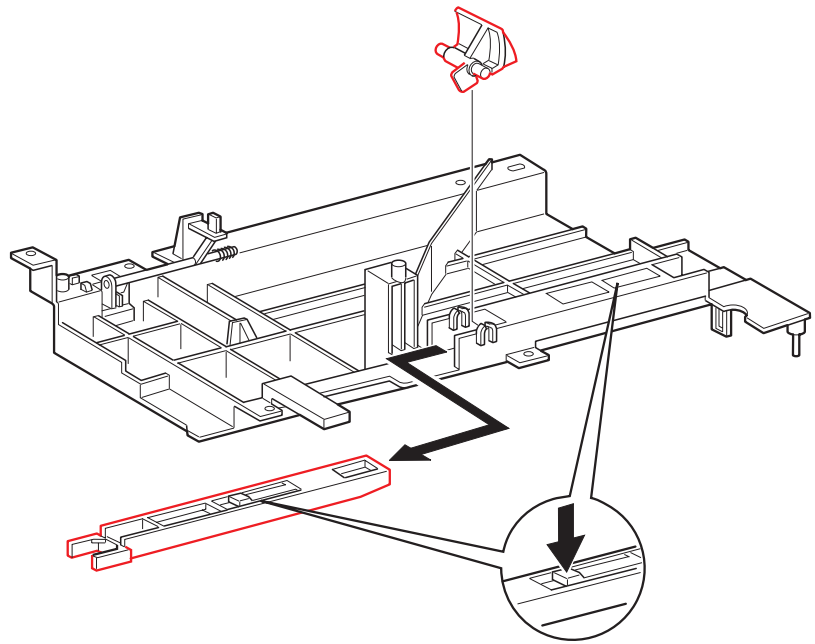


Figure 4-19. “Link Interlock Switch/Cam Interlock Switch” Removal

4.3.14 Chute Exchange

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out.(Section 4.3.27)
7. Remove the Fuser Assembly.(Section 4.3.31)
8. Squeeze together the latch tabs of the left (right side of the printer) Cap Chute Exchange and press the latch tabs out of the hole in the Frame, and hold the Chute Exchange in the position.
9. Squeeze together the latch tabs of the right (left side of the printer) Cap Chute Exchange and carefully pull the Chute Exchange away from the Frame, together with the Caps Chute Exchange.

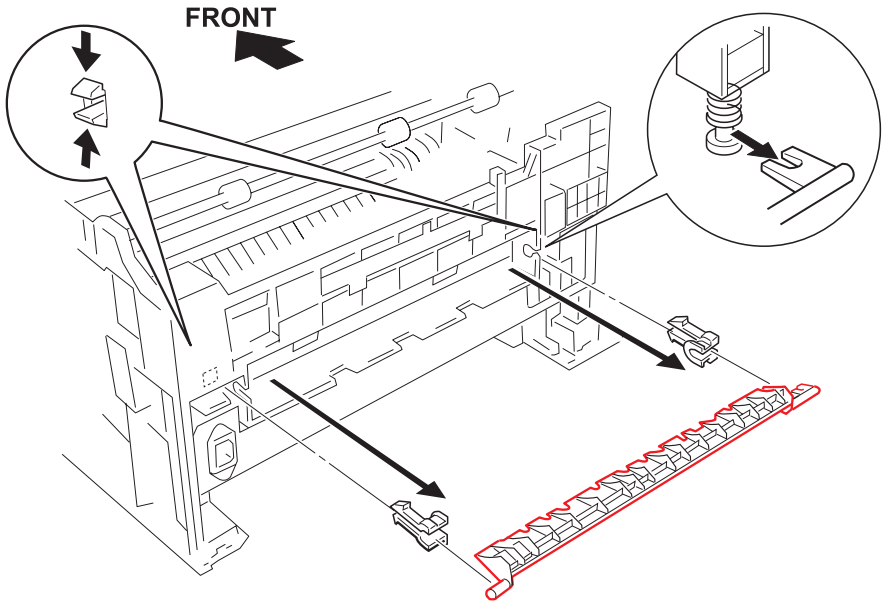


Figure 4-20. “Chute Exchange” Removal

CHECK POINT

Correctly direct the latch tabs of CAP CHUTE EXCHANGE to a hole of the frame by viewing through the gaps.

4.3.15 Actuator Exit-2/L, -2/S and Sensor Photo

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the three screws that secure the Plate Base Actuator, and remove the Plate Base Actuator, taking care to keep the Actuator Exit-2/L and -2/S mounted on the Plate in place.
7. Note how the Spring Exit- 2/L and -2/S are attached to the Actuators.
8. Lift the Actuator Exit-2/L, along with the Spring Exit-2/L, out of the Plate.
9. Lift the Actuator Exit-2/S, along with the Spring Exit-2/S, out of the Plate.
10. Press together the hooks of the Sensor Photo while pushing the Sensor out through the Frame.
11. Disconnect J285 from the Sensor Photo.

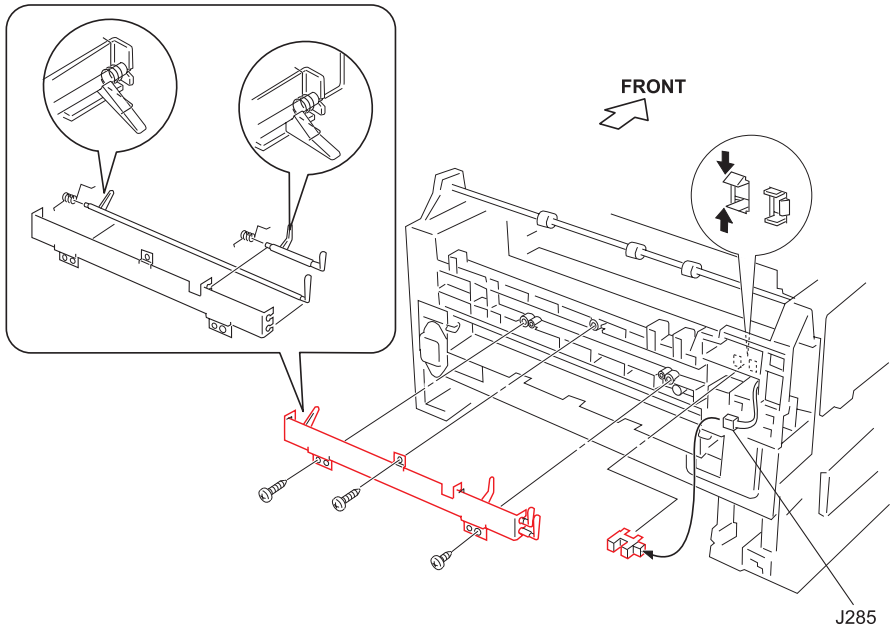


Figure 4-21. "Actuator Exit-2/L,2/S and Sensor Photo" Removal

4.3.16 Solenoid Exchange

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the two screws that secure the Solenoid Exchange (Direction solenoid) to the Printer Frame.
9. Take the Solenoid out of the Frame, tilting the top of the Solenoid away from the Frame while pushing in the bottom end of the Solenoid plunger upward obliquely to disengage the Solenoid plunger from the forked arm of the Chute Exchange.

CHECK POINT

- **Position the SOLENOID EXCHANGE as to locate the screw holes on your right.**
- **Make sure to engage the solenoid plunger with a falk arm of the CHUTE EXCHANGE while pushing up the arm with your finger.**

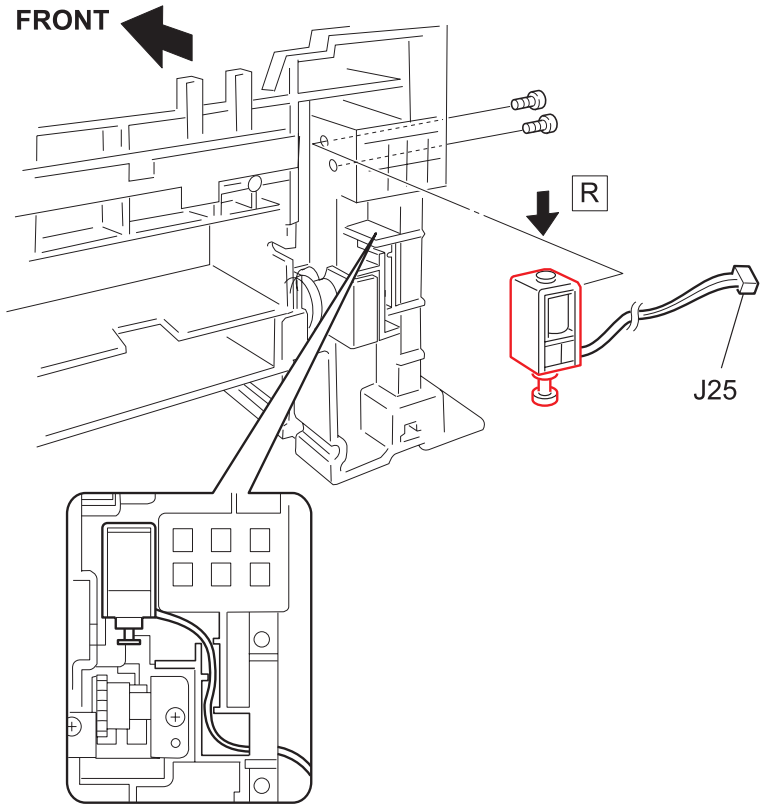


Figure 4-22. “Solenoid Exchange” Removal

4.3.17 Gear Duplex Assembly

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the two screws that secure the Gear Duplex Assembly to the rear of the Printer Frame.
7. Remove the Gear Duplex Assembly out of the Printer Frame.

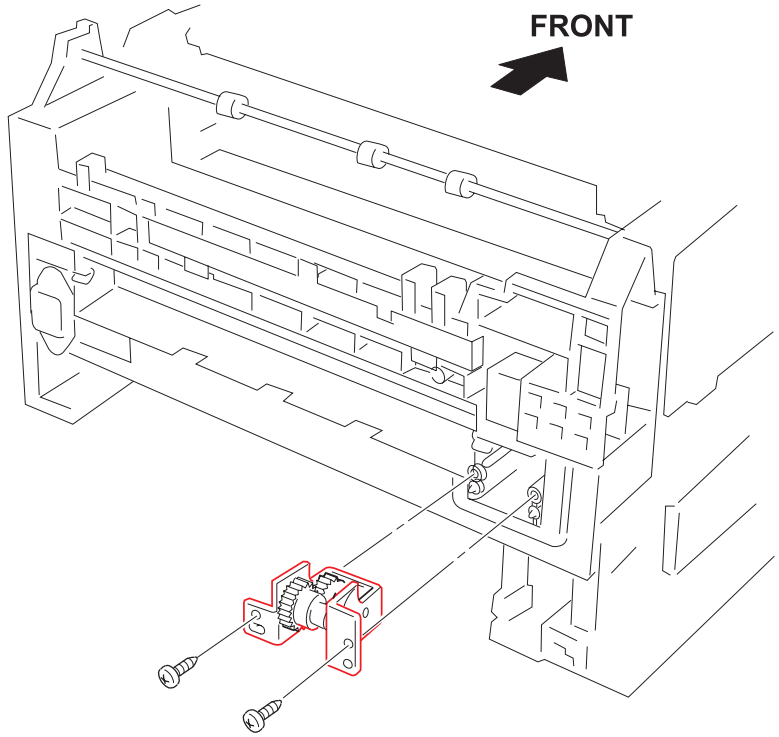


Figure 4-23. “Gear Duplex Assembly” Removal

4.3.18 Roll Assembly Pinch Pre-Registration

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Pull the Lever Jam Clear off of the retaining brackets (1).
7. Remove the Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (2).
8. Remove the Frame Assembly MBF.(Section 4.3.19)
9. Remove the C258MAIN Board.(Section 4.3.49)
10. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
11. Remove the PWBA Hotaru.(Section 4.3.48)
12. Remove the Actuator No Paper.(Section 4.3.8)
13. Remove the Drive Assembly-F/P.(Section 4.3.42)
14. Remove the Drive Assembly Main.(Section 4.3.43)
15. Remove the Sensor Toner if installed.
16. Remove the Kit Chute Registration Assembly. (Section 4.3.11)
17. Squeeze together the latches of the Roll Assembly Pinch Pre-registration (3) and take it out of the Frame (4).

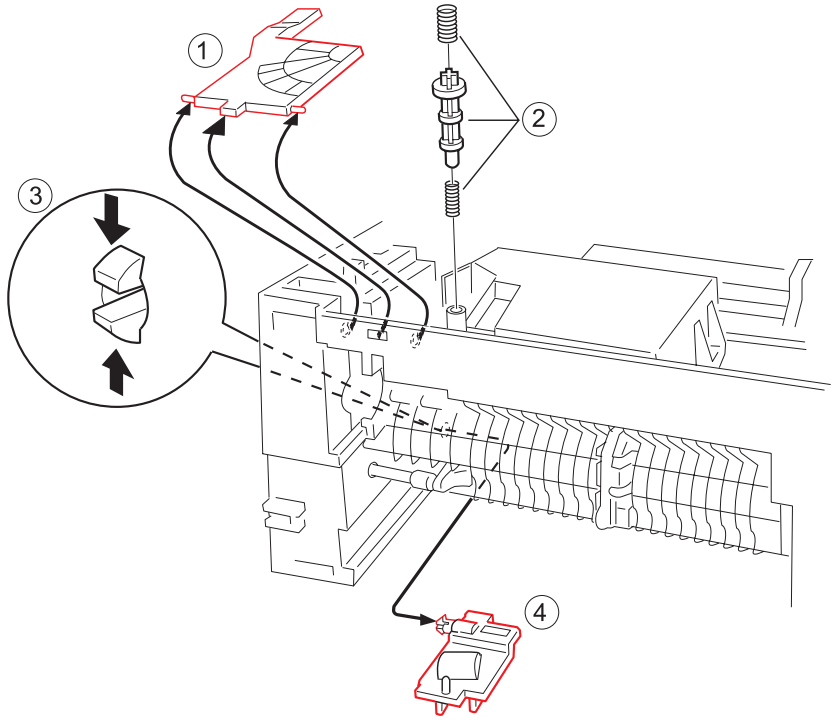
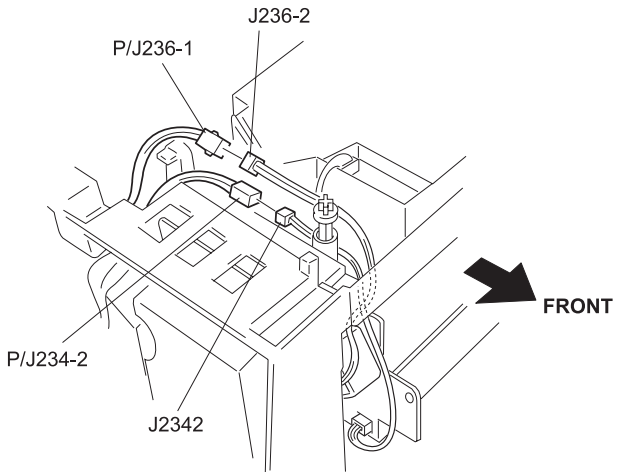


Figure 4-24. “Roll Assembly Pinch Pre-Registration” Removal

4.3.19 Frame Assembly MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Disconnect P236-1/J236-2 and P234-2/J2342.
8. Remove the four screws that secure the Frame Assembly MBF to the Printer Frame.
9. Slowly take the Frame Assembly MBF off of the Frame, manipulating so that the free end of the shaft of the Roll Assembly MBF comes out of the receptacle.



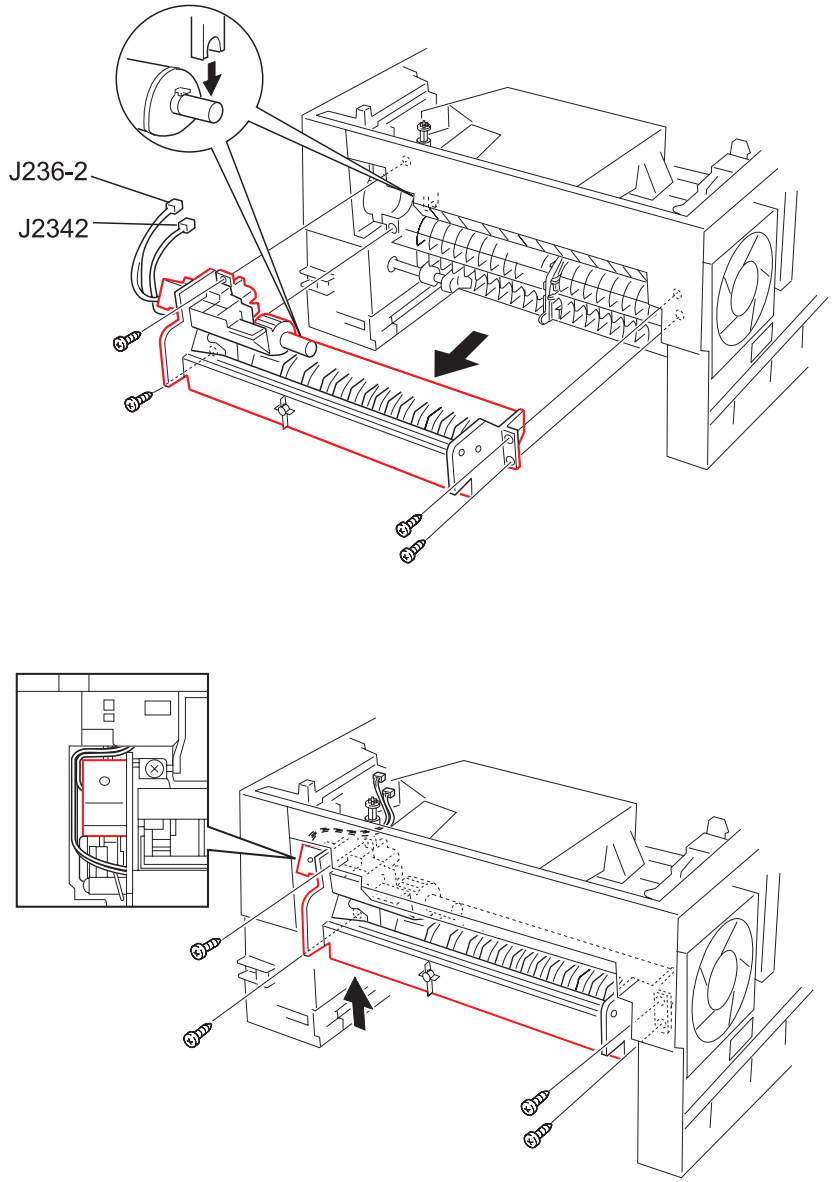


Figure 4-25. “Frame Assembly MBF” Removal

4.3.20 Solenoid MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Disconnect P234-2/J2342.
8. Remove the Frame Assembly MBF.(Section 4.3.19)
9. Remove the screw that secures the Solenoid MBF to the Frame Assembly MBF.
10. Press down on the Solenoid arm to free it from the gears and remove the Solenoid.

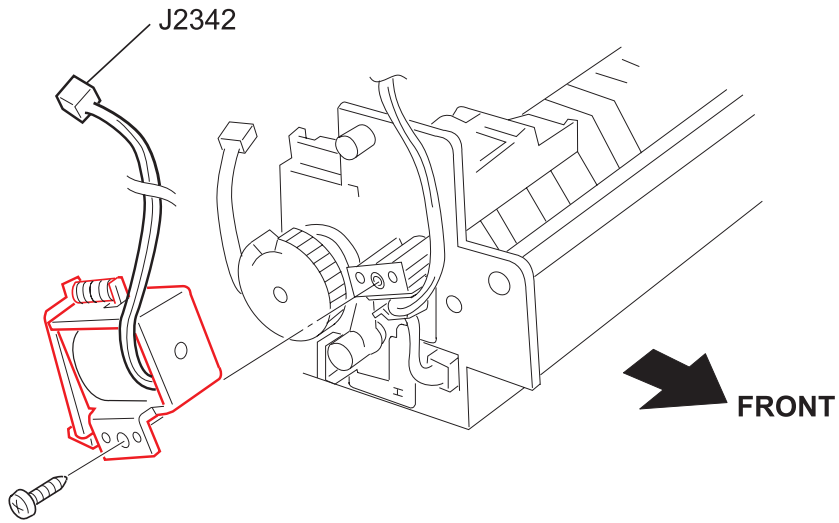


Figure 4-26. “Solenoid MBF” Removal

4.3.21 Roll Assembly MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Pull up the Roll latch and slide the Roll Assembly MBF off of the shaft.

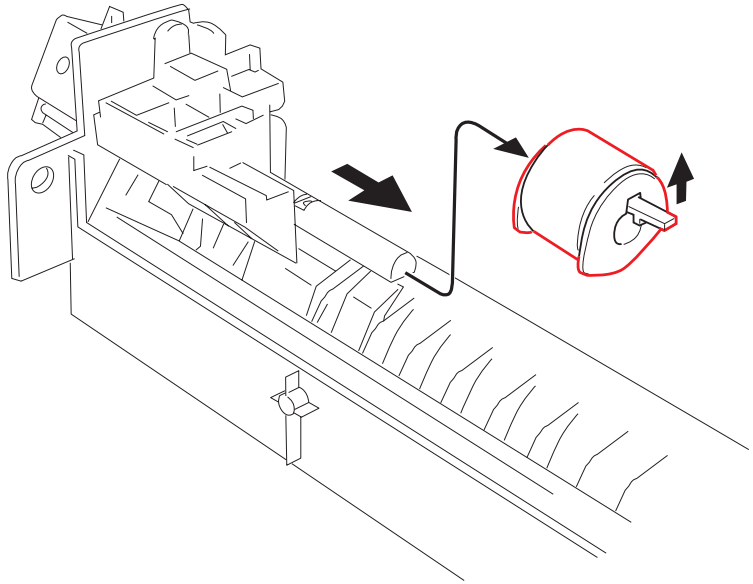


Figure 4-27. “Roll Assembly MBF” Removal

4.3.22 Holder Gear MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the Roll Assembly MBF.(Section 4.3.21)
9. Remove the screw that secures the Holder Gear MBF to the Frame MBF.
10. Press the latch beside the Solenoid arm to release the Holder Gear MBF.
11. Reach under the Holder and press the spring-loaded lever while you slide the Holder Gear MBF out of the shaft of the Gear Assembly MBF.
12. Be careful not to lose the Spring Lever MBF because it is not fixed to the Holder Gear MBF nor to the Lever MBF .

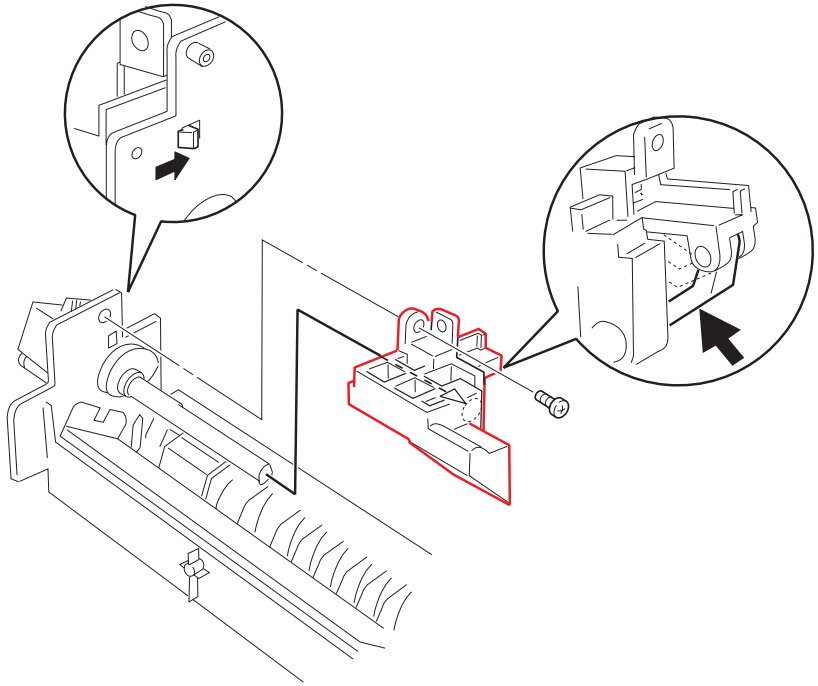


Figure 4-28. “Holder Gear MBF” Removal

4.3.23 Gear Assembly MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the Roll Assembly MBF.(Section 4.3.21)
9. Remove the Holder Gear MBF. (Section 4.3.22)
10. Pull up on the Cam MBF latch while you slide the Cam MBF off of the shaft of the Gear Assembly MBF (1).
11. Push the Lever Gear out of the way (2) and slide the Gear Assembly MBF out of the bearing hole (3).
12. Remove the Bearing MBF from the bearing hole.

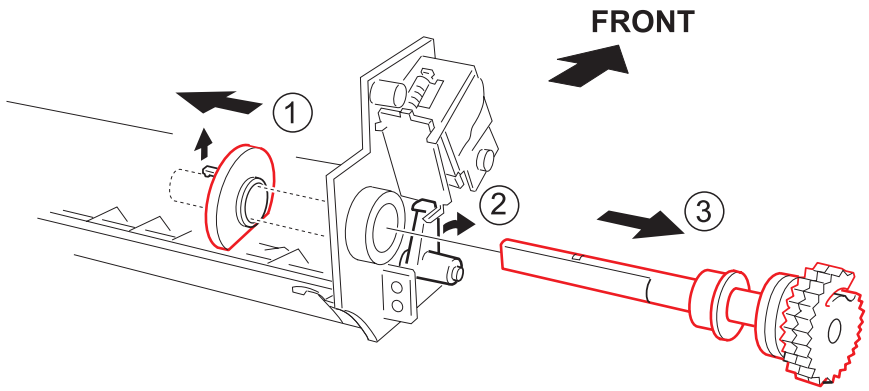


Figure 4-29. “Gear Assembly MBF” Removal

4.3.24 Plate Assembly Bottom MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the Roll Assembly MBF.(Section 4.3.21)
9. Remove the Holder Gear MBF. (Section 4.3.22)
10. Pry the right pivot arm of the bottom Plate by a small flat screwdriver blade away from the right side of the Frame MBF.
11. Slide the left end of the Bottom Plate away from the left side of the Frame MBF and remove the Plate Assembly Bottom MBF.

Be careful not to lose the Spring Normal Force MBF because it is not fixed to the Frame MBF nor to the MBF Bottom Plate.

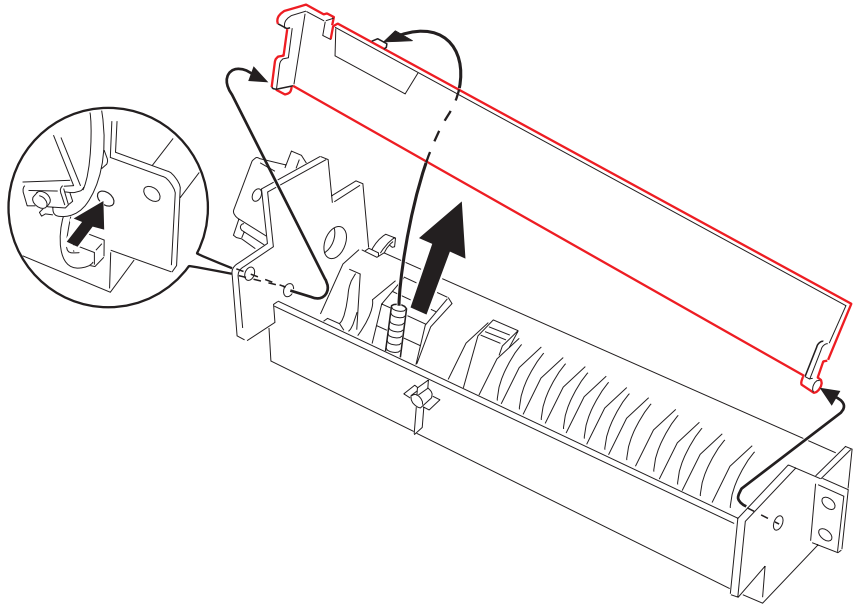


Figure 4-30. “Platen Assembly Bottom MBF” Removal

4.3.25 Sensor No Paper MBF

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF.(Section 4.3.19)
8. Remove the Roll Assembly MBF.(Section 4.3.21)
9. Remove the Holder Gear MBF. (Section 4.3.22)
10. Remove the Plate Assembly Bottom MBF. (Section 4.3.24)
11. Disconnect J236-2.
12. Squeeze together the clips that are holding the Sensor No Paper MBF to the bottom of the Frame Assembly MBF and remove the Sensor No Paper MBF from the Frame together with the Harness Sensor MBF.
13. Disconnect J236-3 to remove the Harness Sensor MBF from the Sensor No Paper MBF.

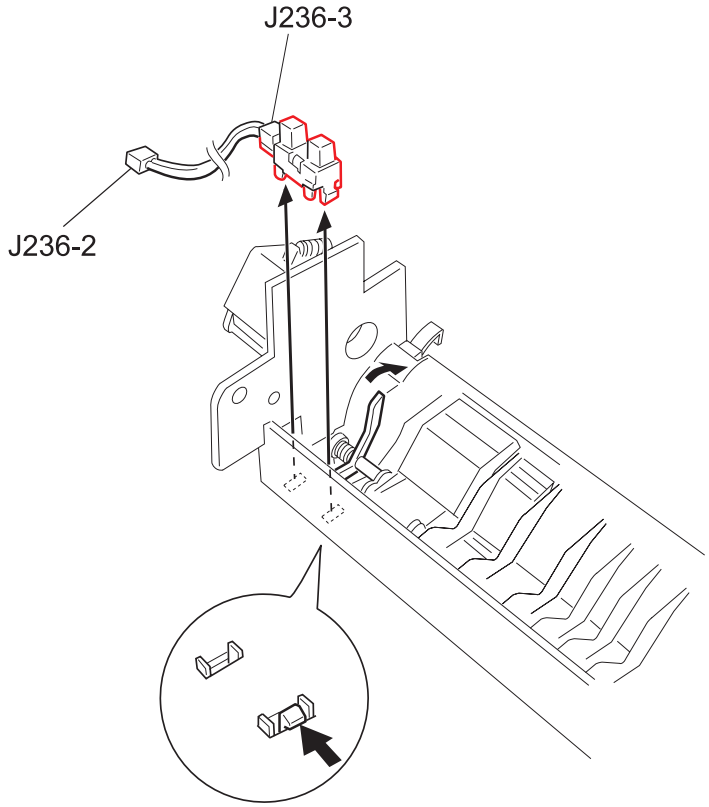


Figure 4-31. “Sensor No Paper MBF” Removal

4.3.26 Pad Assembly Retard and Stopper Paper

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Lever Jam Clear, Spring-Hold Rod, Stopper Rod, and Spring Nip Pre-Registration (steps 6 and 7 of RRP 4.1.1).
7. Remove the Frame Assembly MBF .(Section 4.3.19)
8. Remove the Roll Assembly MBF .(Section 4.3.21)
9. Remove the Holder Gear MBF . (Section 4.3.22)
10. Remove the Gear Assembly MBF . (Section 4.3.23)
11. Remove the Plate Assembly Bottom MBF. (Section 4.3.24)
12. Release the two latches of the Pad Assembly Retard by a flat screwdriver blade and pull up the Pad Assembly Retard off of the two pivot points.
13. Pull up the Stopper Paper off of the two pivot points.

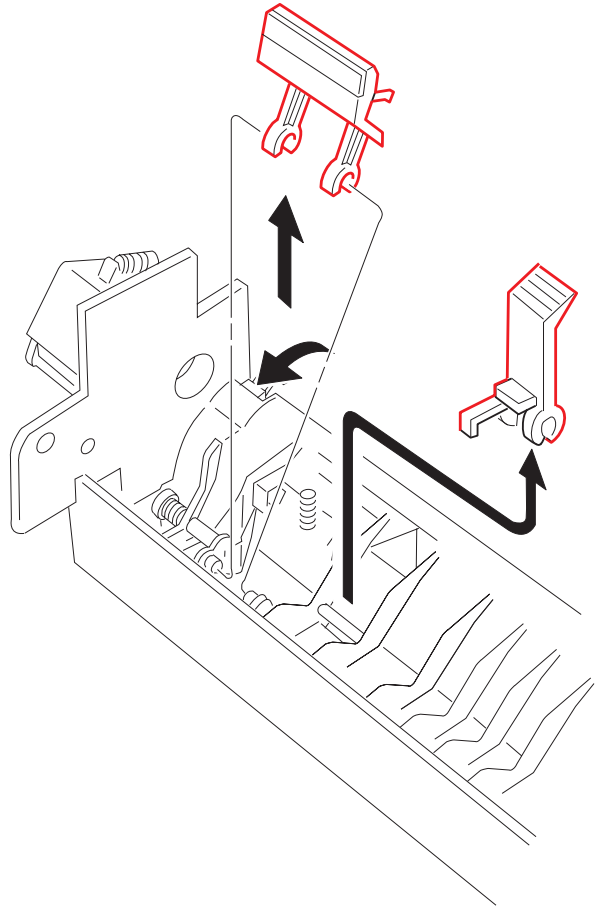


Figure 4-32. “Pad Assembly / Stopper Paper” Removal

4.3.27 Roll Assembly Exit Out

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Release the latch on the Bearing-Exit Roll SP (PL5.1.5: right bearing) and slide the Bearing off of the shaft.
7. Release the latch on the Gear Exit Out, and slide the Roll Assembly Exit Out to the right to get the left end of the shaft out of the Bearing-Exit Roll (PL5.1.6: left bearing).
8. Remove the Roll Assembly Exit Out out of the left bearing hole.
9. Remove the Roll Assembly Exit Out and the Bearing-Exit Roll.

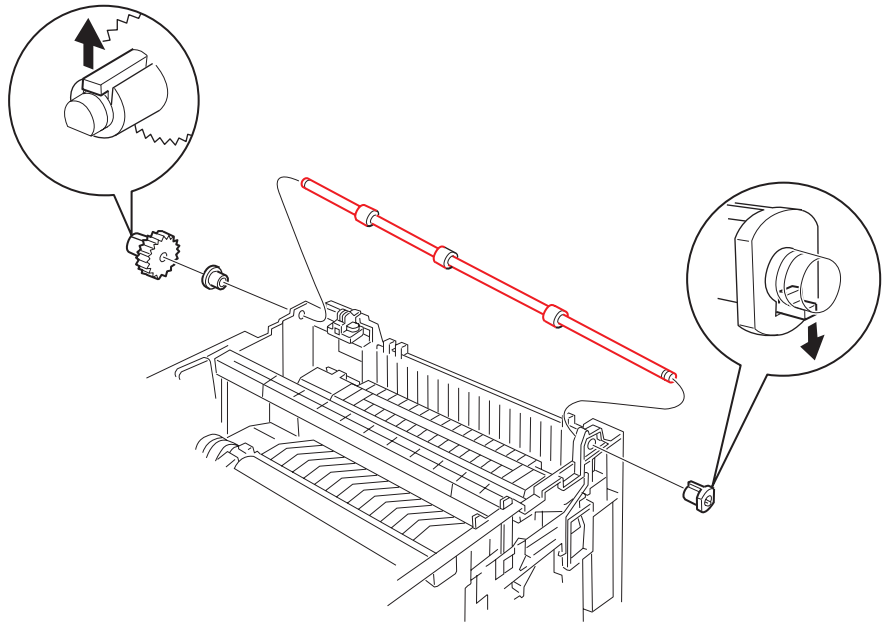


Figure 4-33. “Roll Assembly Exit Out” Removal

4.3.28 Roll-Press and Bearing-Pressure Roll

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove Roll Assembly Exit Out.(Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Pull up one end of the Roll-Press out of the Bearing Pressure Roll and lift the Roll-Press out of the Printer Frame.

CHECK POINT

Do not touch the surface of the Roll-Press with fingers. Hold the Roll-Press by the shaft or the ends of the Roll-Press.

9. Remove the two screws that secure each Bearing Pressure Roll.
10. Lift the Bearing-Pressure Roll off the Printer Frame.

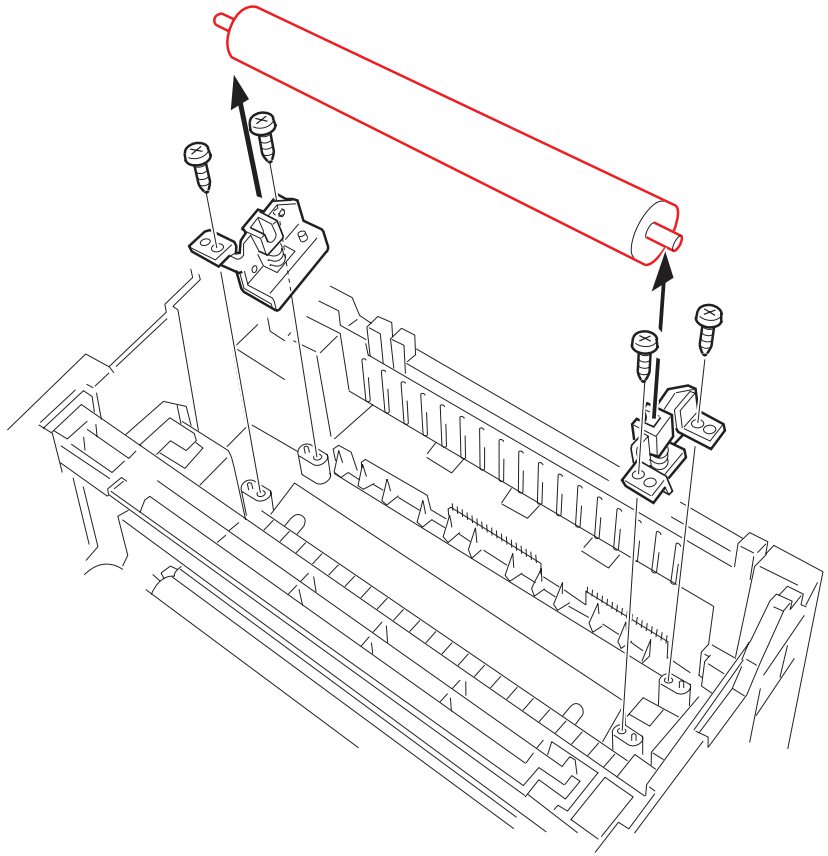


Figure 4-34. “Roll-Press / Bearing-Pressure Roll” Removal

4.3.29 Actuator-Exit

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove Roll Assembly Exit Out.(Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Pull the Actuator-Exit out of the retaining slots in the Printer Frame.

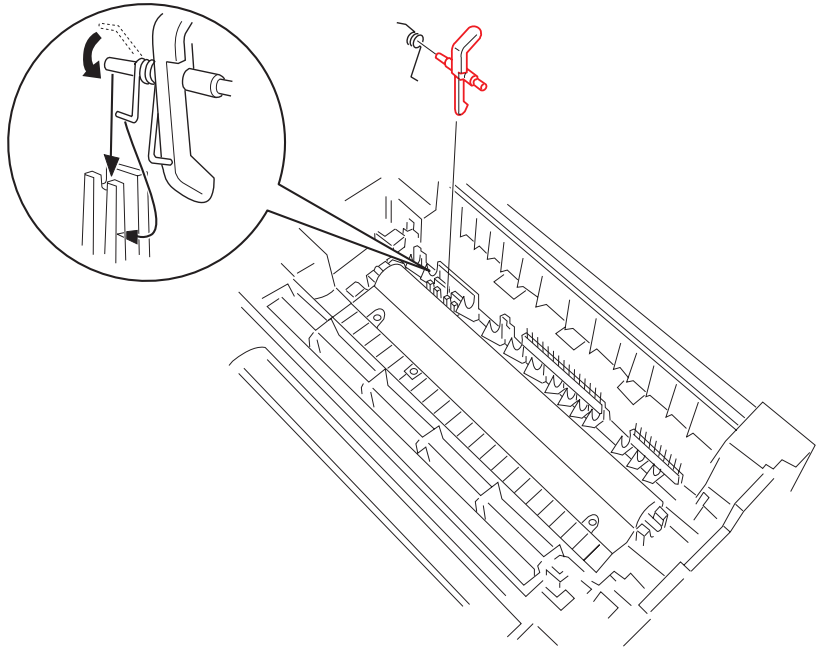


Figure 4-35. “Actuator-Exit” Removal

4.3.30 Sensor Assembly Photo Exit

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove Shield Assembly Bottom (E).(Section 4.3.44)
8. Remove PWBA Hotaru.(Section 4.3.48)
9. Remove the Chassis Assembly PS. (Section 4.3.46)
10. Set the printer on the front surface.
11. Press and release the latches of the Sensor Assembly Photo Exit and remove the Sensor from the Printer Frame (1).
12. Disconnect J281 from the Sensor.

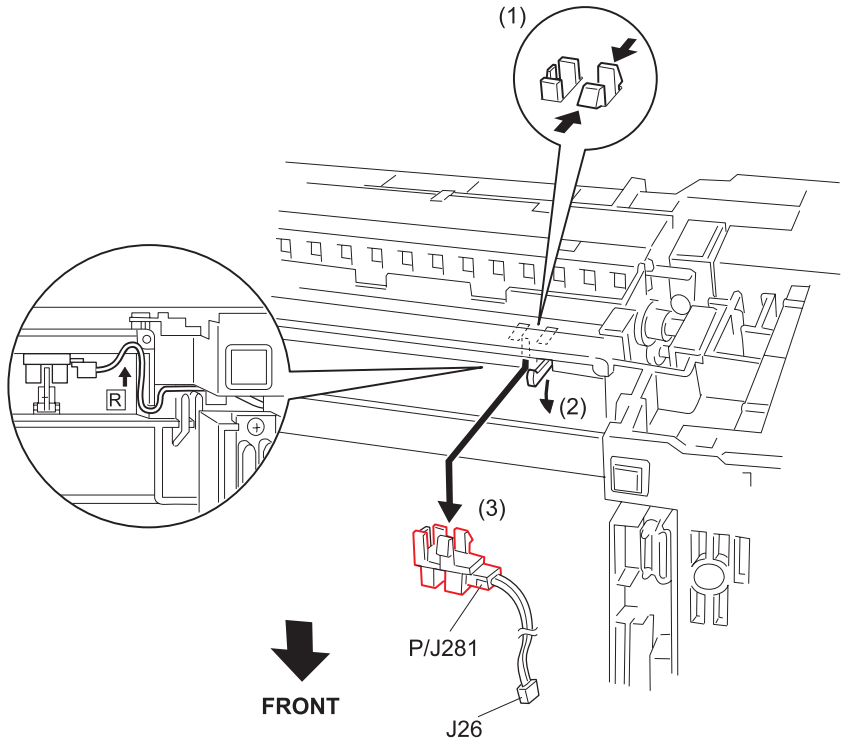


Figure 4-36. "Sensor Assembly Photo Exit" Removal

4.3.31 Fuser Assembly

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Disconnect J291 from the Fuser Assembly.
8. Disconnect P/J11 on the wires (AC supply circuit) from the PWBA PS.
9. Remove the four screws that secure the Fuser Assembly to the Printer Frame.
10. Lift up the left side (drive side) of the Fuser Assembly, then lift the entire Fuser Assembly out of the Frame.

CHECK POINT

Be careful not to break the Actuator Exit-2/L or 2/S when replacing the Fuser Assembly. If you attempt to lower the Fuser Assembly with the Fuser Assembly being caught by the Actuator Exit-2/L or -2/S, the Actuator can break. Raise the Actuators Exit-2/L and 2/S when lowering the Fuser Assembly into place so that the Fuser Assembly is not caught by the Actuator Exit-2/L or -2/S.

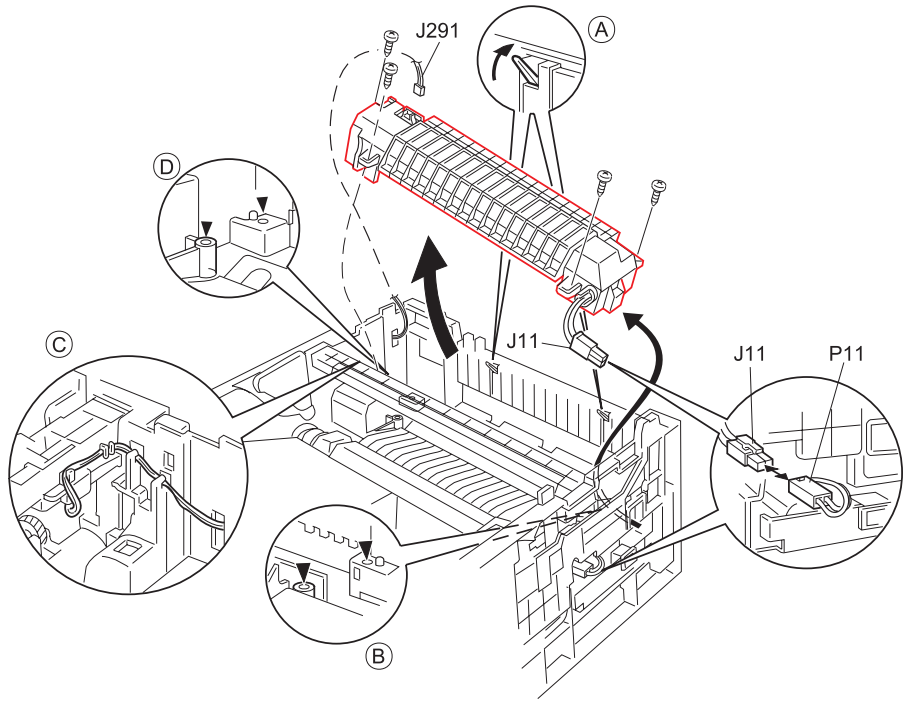


Figure 4-37. “Fuser Assembly” Removal

4.3.32 Sensor Assembly Temperature

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Remove Roll Assembly Exit.(Section 4.3.34)
9. Remove the Roll Fuser and Heater Quartz from the Fuser Assembly.(Section 4.3.36)

CAUTION

- **Do not touch the surface of the Roll Fuser. Hold the ends of the Roll Fuser when handling the Roll Fuser.**
- **Do not touch the Heater Quartz with your fingers. Hold the Heater by the metal tabs that are attached to the ends of the Heater when handling the Heater Quartz.**

10. Remove the screw that secures the Sensor Assembly Temperature to the Fuser Frame.
11. Disconnect J292.

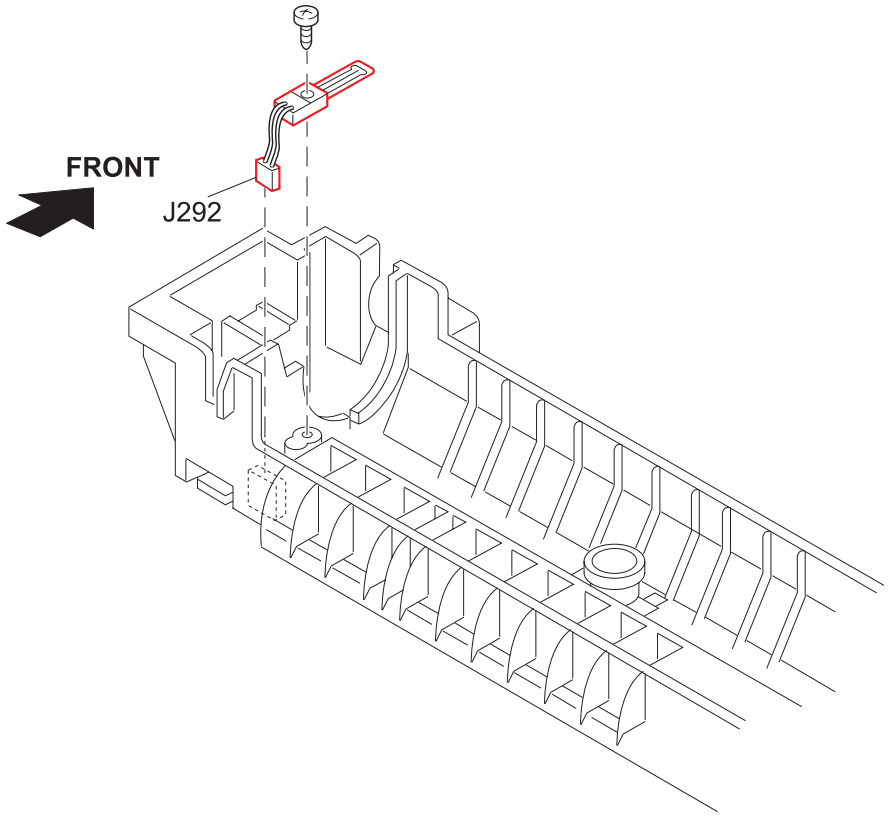


Figure 4-38. “Sensor Assembly Temperature” Removal

4.3.33 Thermostat and Fuse

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Remove Roll Assembly Exit.(Section 4.3.34)
9. Remove the Roll Fuser and Heater Quartz from the Fuser Assembly.(Section 4.3.36)

CAUTION

- **Do not touch the surface of the Roll Fuser. Hold the ends of the Roll Fuser when handling the Roll Fuser.**
- **Do not touch the Heater Quartz with your fingers. Hold the Heater by the metal tabs that are attached to the ends of the Heater when handling the Heater Quartz.**

10. Remove the two screws that secure the Thermostat to the Fuser Frame and remove the Thermostat.
11. Remove the one screw that retains one end of the Fuse to the Fuser Frame.
12. Remove the short strip conductor over the left leg of the Fuse, and remove the Fuse.

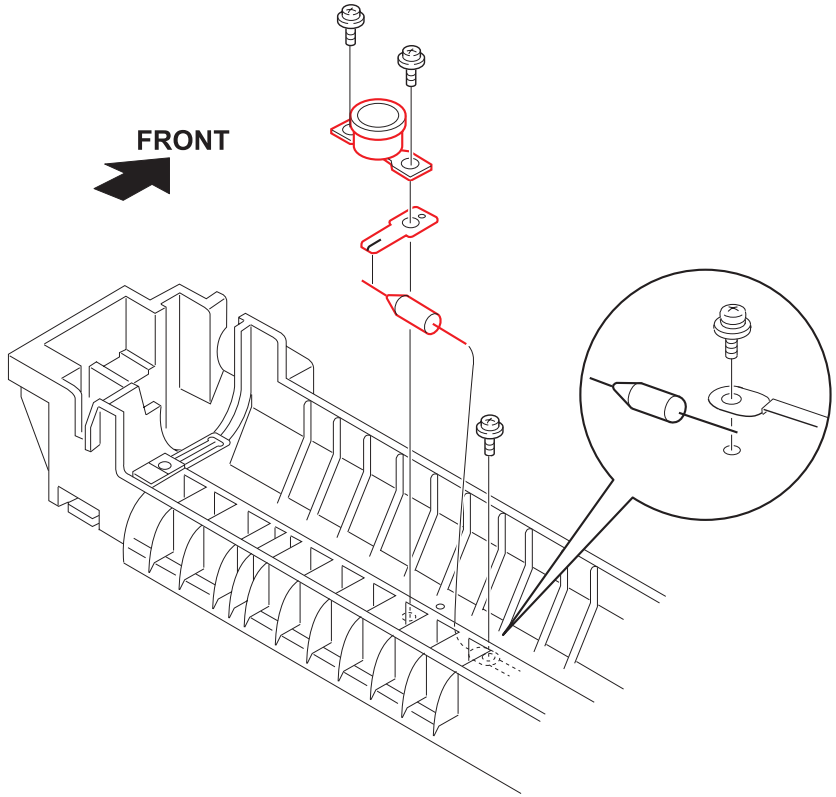


Figure 4-39. “Thermostat/Fuse” Removal

4.3.34 Roll Assembly Exit

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Turn the Fuser Assembly upside down.
9. Release (press down) the latch on the Bearing-Exit Roll SP (right bearing) with the blade of a small screwdriver (1) and slide the Bearing off of the shaft.
10. Release the latch on the Gear-Exit with the blade of a small screwdriver (2) and slide the Roll Assembly Exit to the right to get the left end of the shaft (left end of the shaft is partially cut flat) out of the Bearing-Exit Roll (left bearing).
11. Slide the Roll Assembly Exit to the left to get the right end of the shaft out of the bearing hole.

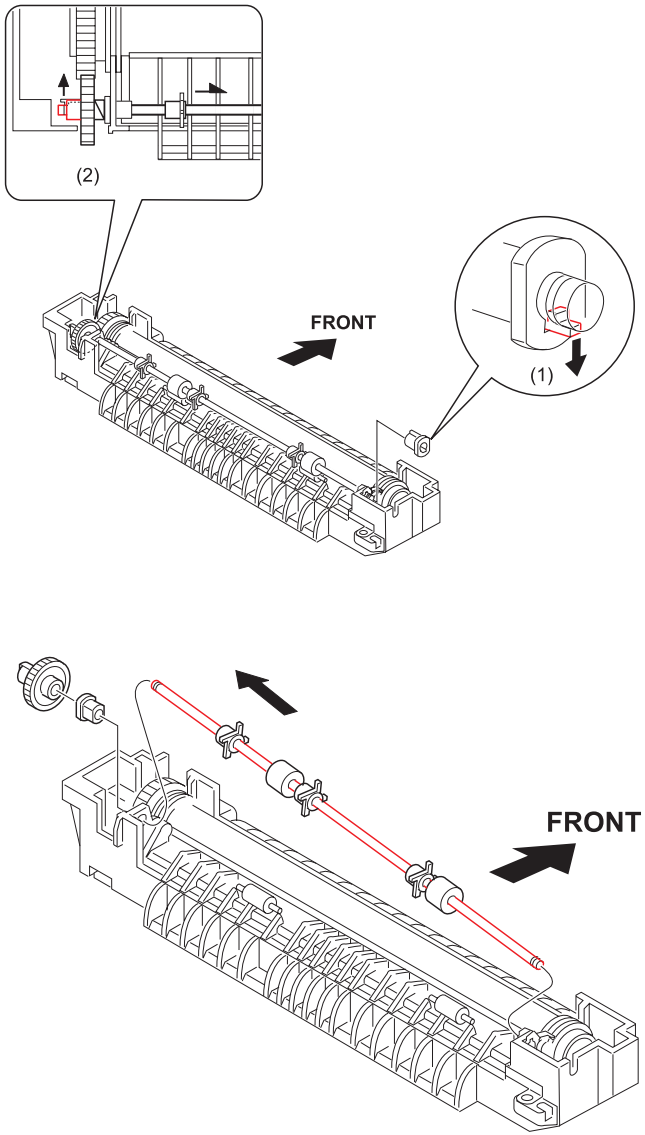


Figure 4-40. 'Roll Assembly" Removal

4.3.35 Roll-Pinch

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Remove the Fuser Assembly. (Section 4.3.31)
8. Remove the Roll Assembly Exit. (Section 4.3.34)
9. Pry the Roll-Pinch off of the Chute-Exit Heat Roll.

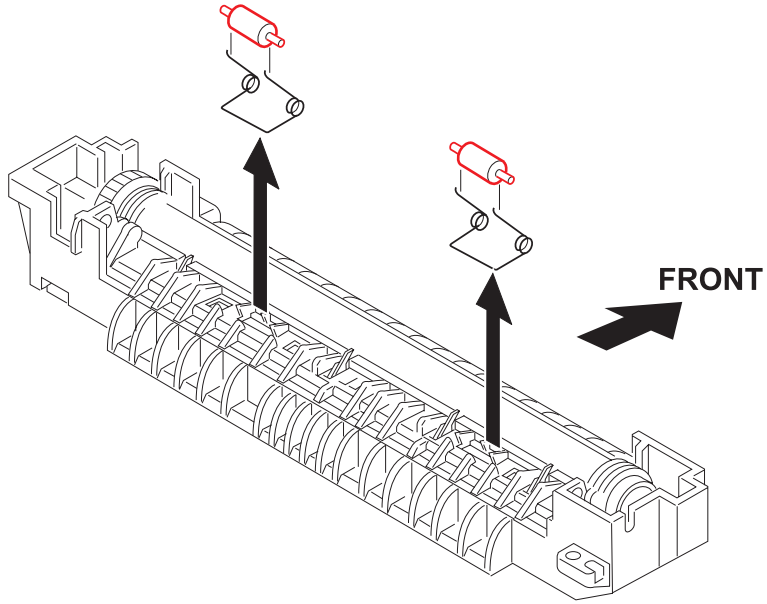


Figure 4-41. “Roll-Pinch” Removal

4.3.36 Roll Fuser and Heater Quartz

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the Roll Assembly Exit Out. (Section 4.3.27)
7. Remove the Fuser Assemble. (Section 4.3.31)
8. Turn the Fuser Assembly upside down.
9. Remove the Roll Assembly Exit. (Section 4.3.34)
10. Remove the two screws that secure the ends of the Heater Quartz to the Fuser Frame.
11. Hold the ends of the Roll Fuser, and lift the Roll Fuser along with the Heater Quartz, Bearings Heat Roll, and Chute-Exit Heat Roll out of the Fuser Frame.
12. Hold the metal tabs attached to the ends of the Heater Quartz and carefully slide the Heater Quartz out of the Roll Fuser.

CAUTION

Do not touch the Heater Quartz with your fingers. Hold the Heater by the metal tabs that are attached to the ends of the Heater.

13. Press the Ring-Rollers out of the grooves and slide them off of the Roll Fuser.
14. Slide the Bearings Heat Roll off of the Roll Fuser.

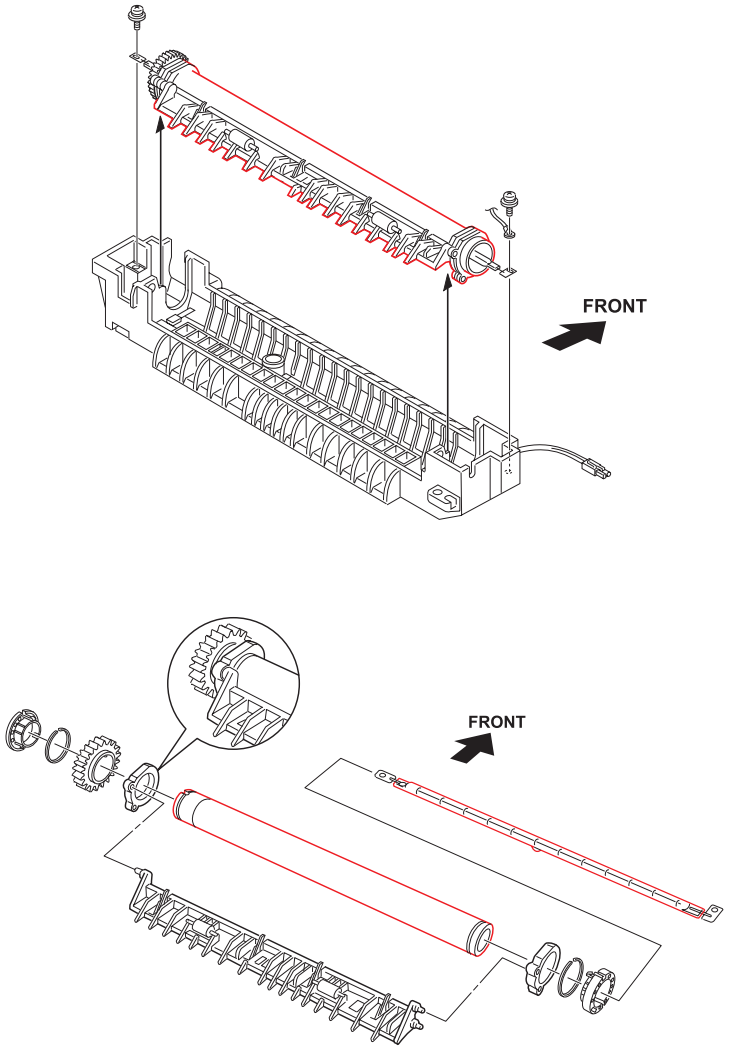


Figure 4-42. “Roll-Fuser / Heater Quartz” Removal

4.3.37 ROS Assembly

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Disconnect J2262 connected to the ROS Assembly.
7. Remove the five screws that secure the ROS Assembly to the Printer Frame.
8. Disconnect J2312 connected to the ROS Assembly
9. Lift the ROS Assembly off of the Printer Frame.

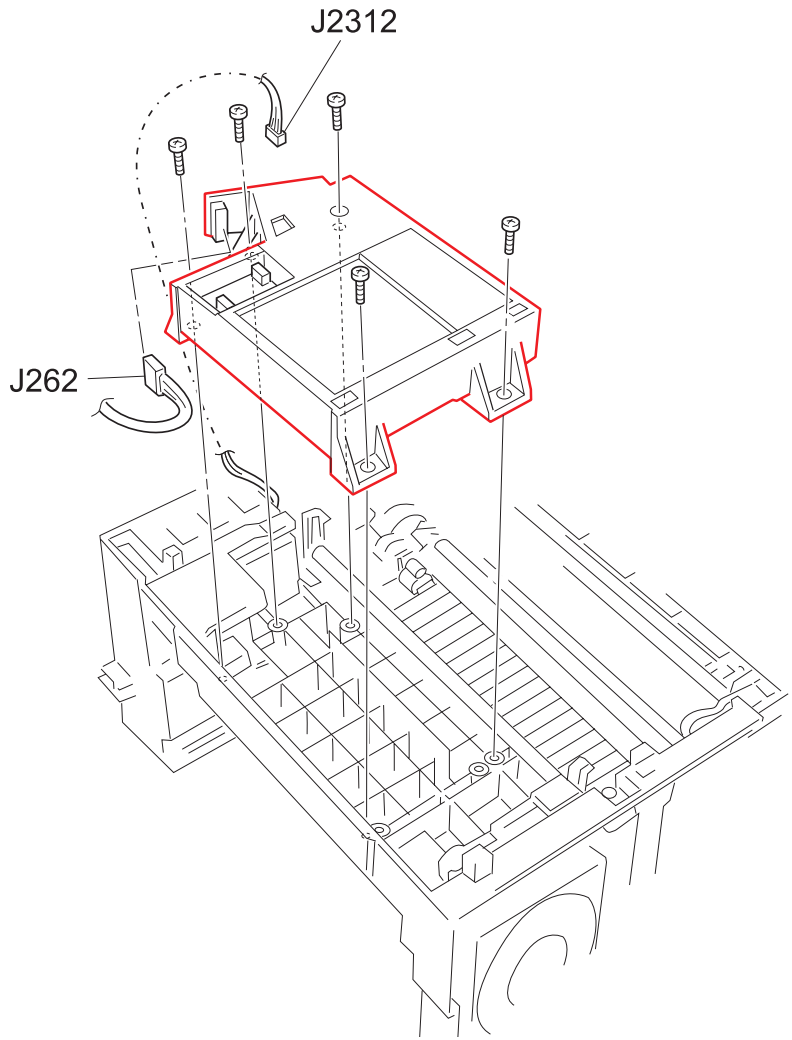


Figure 4-43. “ROS Assembly” Removal

4.3.38 Mirror Assembly

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Release the Harness Assembly SOS-HE extending to the PWBA SOS from the hooks on the Mirror Assembly.
7. Pull the wire harness downward to disconnect J301 from the PWBA SOS.
8. Remove the two screws that secure the Mirror Assembly to the Printer Frame.
9. Remove the Mirror Assembly.

CAUTION

Do not touch the Mirror. Dirt or fingerprints on the mirror can cause print quality problems.

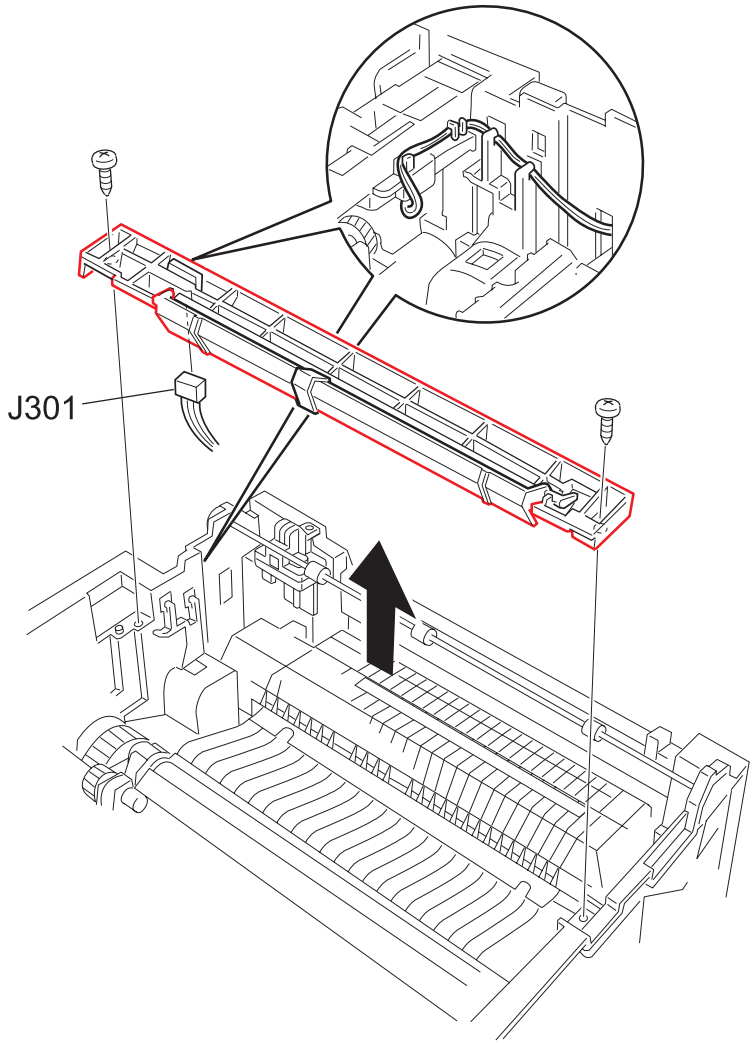


Figure 4-44. “Mirror Assembly” Removal

4.3.39 Roll Assembly BTR

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Place the BTR Tool under the right end of the BTR shaft, and pry the end of the shaft off of the Bearing BTR. (See the illustration for the correct use of the BTR Tool.)
7. Place the BTR Tool under the left end of the BTR shaft, and pry the left end off of the Bearing BTR. (See the illustration for the correct use of the BTR Tool.)
8. Lift the Roll Assembly BTR together with the Chute Assembly BTR out of the Frame.

CAUTION

Do not touch the black sponge rubber roll. Handle the Roll Assembly BTR only by the metal ends.

9. Slide the Gear BTR off of the end of the Roll Assembly BTR shaft.
10. Pull the Chute Assembly BTR away from the Roll Assembly BTR.
11. Pull the Roll Tracking BTR to slide off of each end of the Roll Assembly BTR shaft.

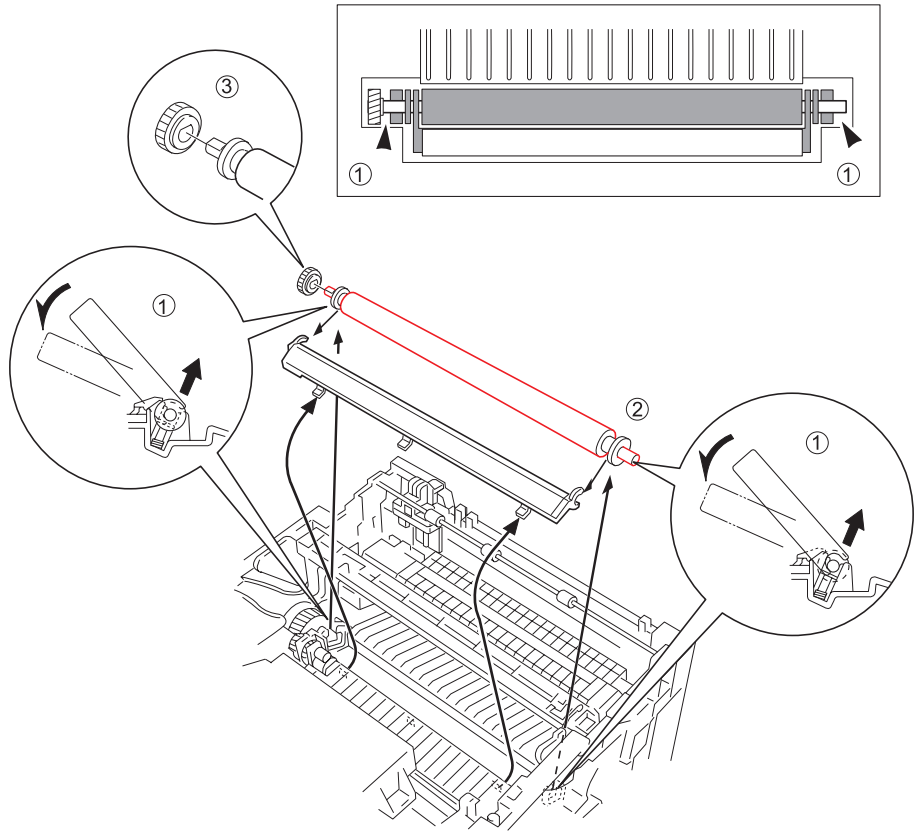


Figure 4-45. “Roll Assembly BTR” Removal

4.3.40 Sensor Toner

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Disconnect J221 from the HPS.
7. Raise the free end of the Chute Inlet Registration and hold the Chute upright.
8. Spread apart the bracket arms that hold the Sensor Assembly Toner and remove the Sensor.

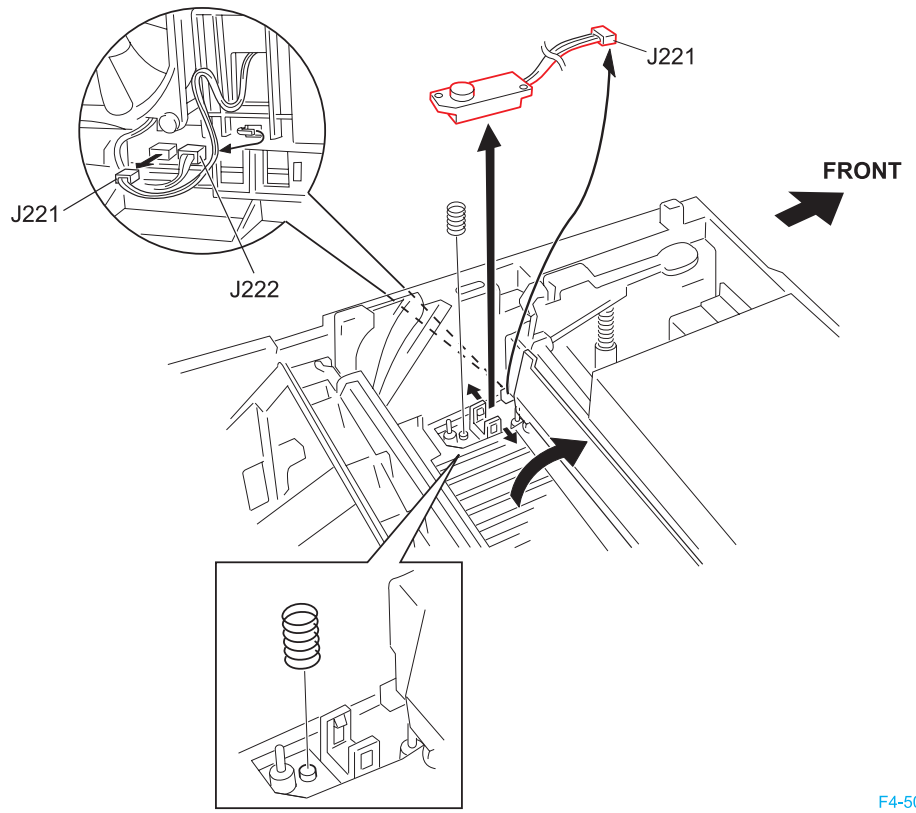


Figure 4-46. “Sensor Toner” Removal

4.3.41 Switch Assembly 5V Interlock

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Disconnect J233 from the Switch Assembly 5V Interlock.
7. Remove the two screws that secure the Switch Assembly 5V Interlock to the Printer Frame.
8. Pull the Switch Assembly 5V Interlock away from the Frame.

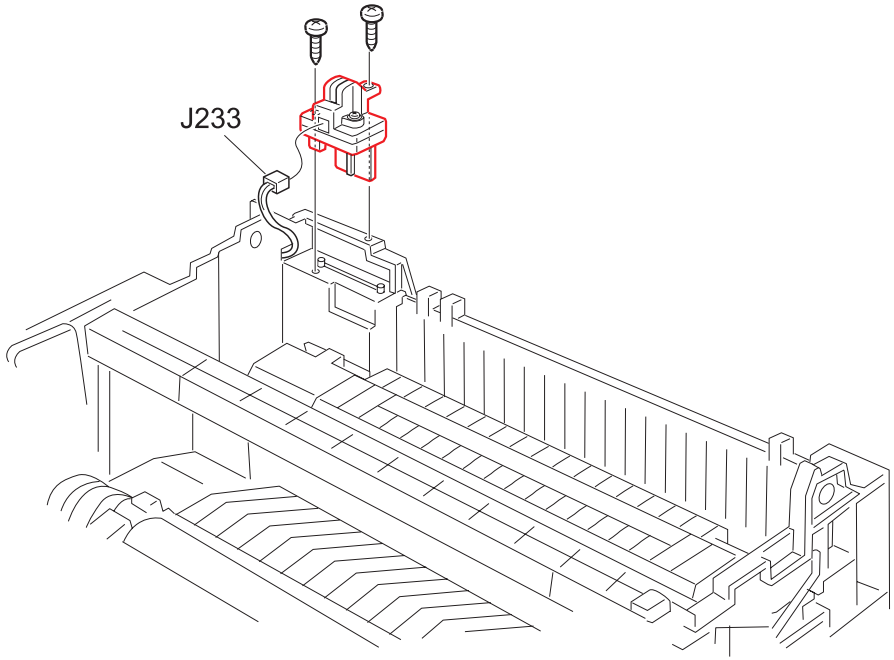


Figure 4-47. “Switch Assembly 5V Interlock” Removal

4.3.42 Drive Assembly-F/P

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the Harness of Drive Assembly Main aside from the front plate of the Drive Assembly-F/P.
9. Release the Harness Assembly ROS-HE from the Drive Assembly-F/P.
10. Remove the four screws that secure the Drive Assembly-F/P to the Printer Frame.
11. Slowly pull the Drive Assembly-F/P away from the Printer Frame.

CHECK POINT

The spring-loaded lever is slightly caught by the bottom part of Gear 10 when you pull the Drive Assembly-F/P straight away from the printer. Manipulate the Drive Assembly-F/P so that the lever clears Gear 10.

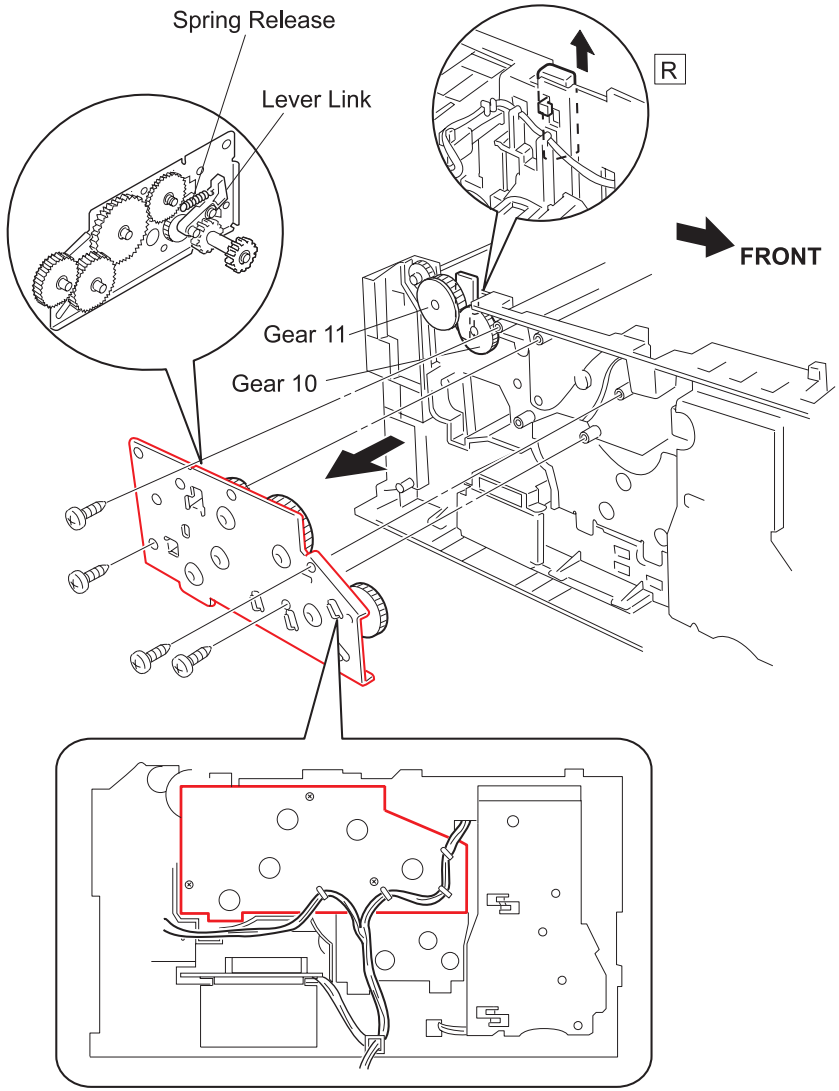


Figure 4-48. “Drive Assembly F/P” Removal

4.3.43 Drive Assembly Main

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E).(Section 4.3.44)
8. Remove the harness of the Drive Assembly-F/P and the Harness Assembly ROS-HE aside from the front plate of the Drive Assembly-F/P.
9. Remove the Drive Assembly-F/P. (Section 4.3.42)
10. Remove the four screws that secure the Drive Assembly Main to the Printer Frame.
11. Slide the Drive Assembly Main out of the Frame.

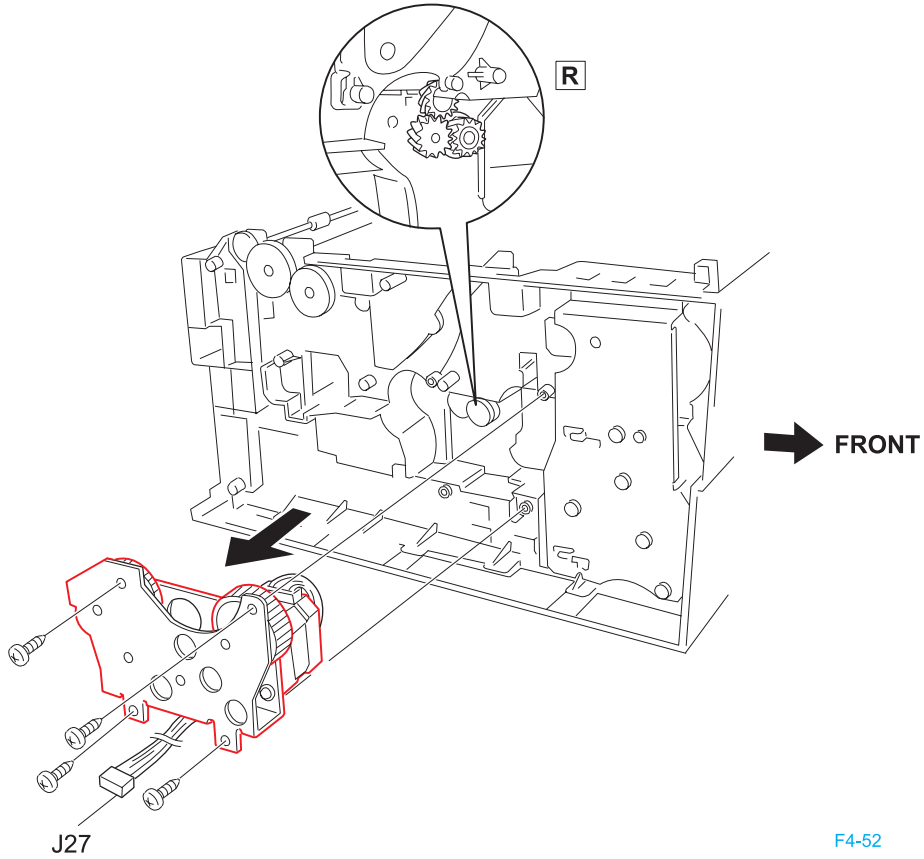


Figure 4-49. “Drive Assembly Main” Removal

4.3.44 Shield Assembly Bottom (E)

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board. (Section 4.3.49)
7. Remove the four screws that secure the Shield Assembly Bottom (E) to the side of the Printer Frame.
8. Remove the two rear screws that secure the Shield Assembly Bottom (E) to the rear of the Printer Frame.
9. Take the Shield Assembly Bottom (E) off the Printer Frame.

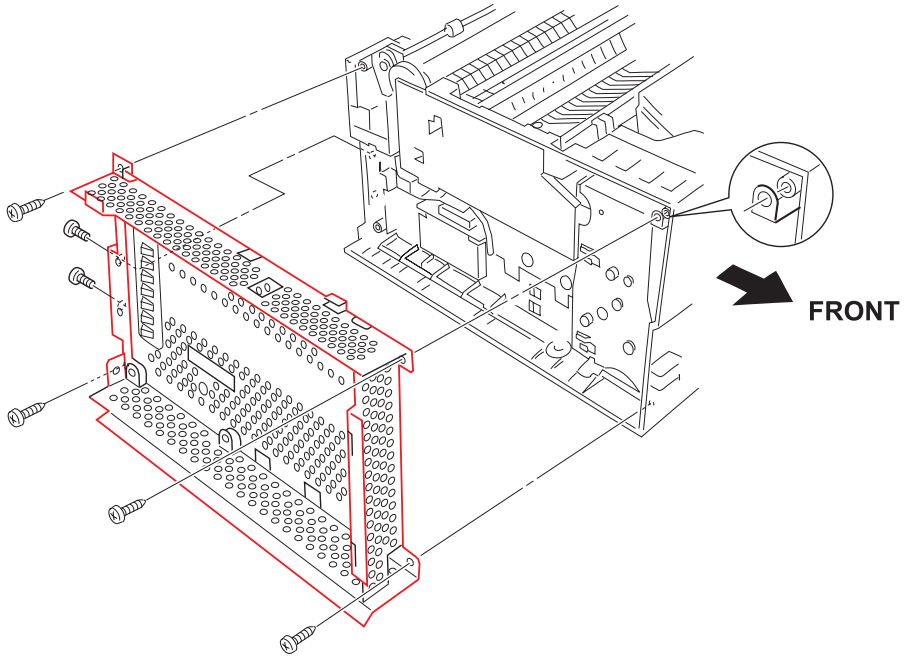


Figure 4-50. “Shield Assembly Bottom” Removal

4.3.45 Fan IOT

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Disconnect J222 from the HPS.
7. Remove the two screws that secure the Fan IOT to the Frame.
8. Pull the Fan straight out and remove it from the Frame.

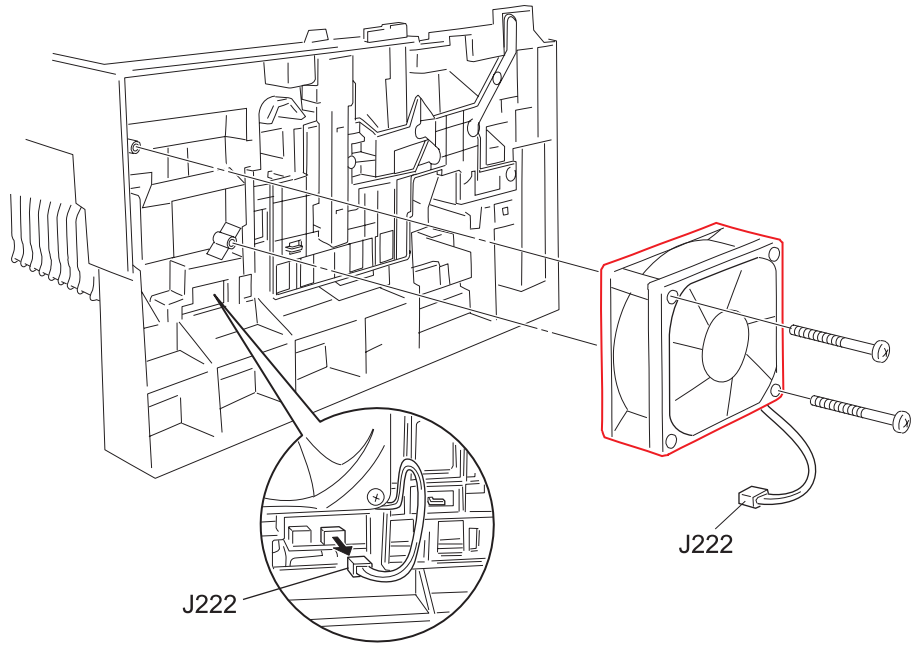


Figure 4-51. “Fan IOT” Removal

4.3.46 Chassis Assembly PS

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the PWBA Hotaru. (Section 4.3.48)
9. Disconnect J221 from the HPS (if the Sensor Toner is installed).
10. Disconnect J222 from the HPS (Fan IOT).
11. Disconnect P/J11 (Fuser).
12. Set the printer on the left side (drive side).
13. Remove the seven screws that secure the Chassis Assembly PS to the bottom of the Frame. Access one of the screws through a hole in the Chassis.
14. Remove the Chassis Assembly PS by pulling the bottom toward you, then sliding the Assembly down and out of the Frame.

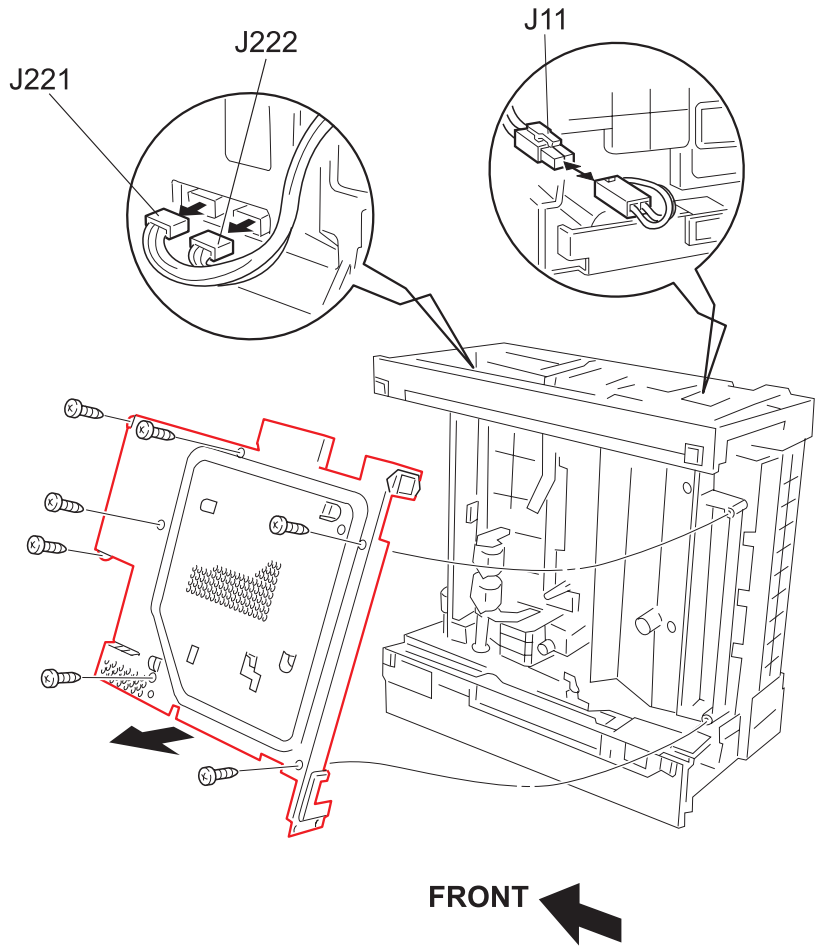


Figure 4-52. “Chassis Assembly PS” Removal

4.3.47 HPS

WARNING

The HPS is electrostatic discharge (ESD) sensitive and must be handled with care to protect it against ESD. Touch exposed metal of the frame or wear properly grounded wrist strap before working with the board to let the electrostatic charge in your body flow off. Avoid touching the wirings on the board with fingers.

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the PWBA Hotaru. (Section 4.3.48)
9. Remove the Chassis Assembly PS. (Section 4.3.46)
10. Remove the two screws that secure the AC Power Receptacle to the Chassis.
11. Remove the screw that secures the grounding wire to the Chassis.
12. Remove the five screws that secure the HPS to the Chassis.
13. Slide the Main Power Switch off of the retaining slot and release the wires from the wire retainer.
14. Slide the HPS to the right to shift the left end from under the retaining tabs on the left end of the Chassis Assembly PS, and then lift it off of the Chassis.

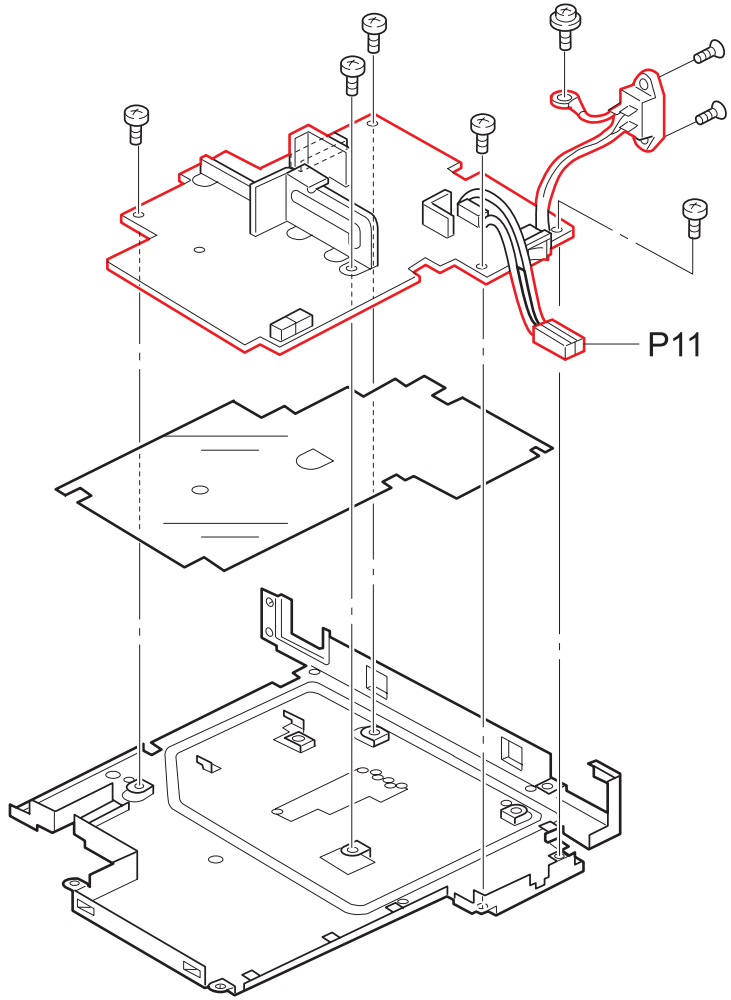


Figure 4-53. “HPS” Removal

4.3.48 PWBA Hotaru

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Remove the C258MAIN Board.(Section 4.3.49)
7. Remove the Shield Assembly Bottom (E). (Section 4.3.44)
8. Remove the screw that secures the Holder Electrical to the Frame (side).
9. If the Cartridge Assembly EP. (CRU) is still installed, remove it.
10. Locate the access hole to the screw that secures the PWBA Hotaru to the Chassis Assembly PS. The hole is located immediately in front of the Fuser Assembly.
11. Remove the screw that is located below the access hole.
12. Slide the Holder Electrical out of the Frame.
13. Disconnect all P/Js from the PWBA Hotaru.
14. Remove the two screws that secure and PWBA Hotaru to the Holder Electrical and remove the PWBA from the Holder.

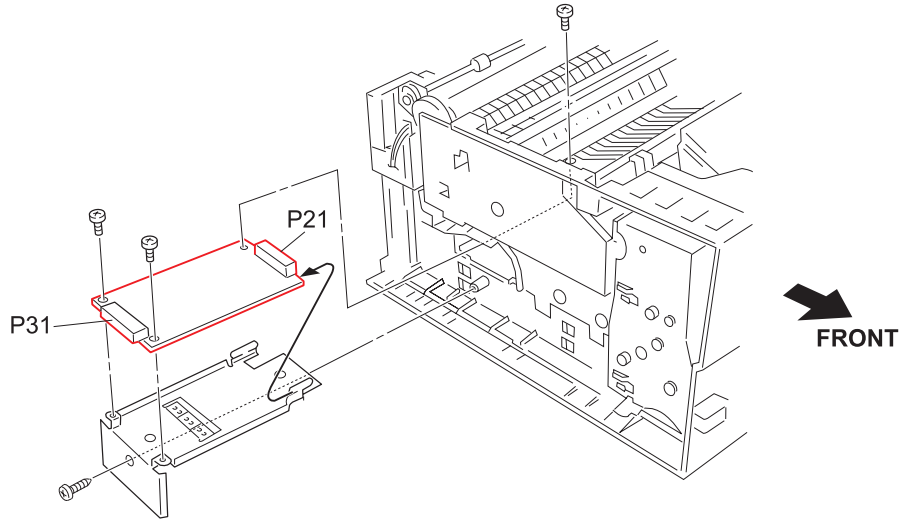


Figure 4-54. “PWBA Hotaru” Removal

4.3.49 C258MAIN Removal

WARNING

C258MAIN board is electrostatic discharge (ESD) sensitive and must be handled with care to protect it against ESD. Touch exposed metal of the frame or wear properly grounded wrist strap before working with the board to let the electrostatic charge in your body flow off. Avoid touching the wirings on the board with fingers.

CHECK POINT

When replacing C258MMAIN with a new one, try prints a Status Page to obtain the current printer settings before removing it.

1. Remove the Cover Side, E. (Section 4.2.1)
2. Disconnect connector CN9 at the upper right part of C258MAIN.
3. Disconnect connector CN222/J22, CN223/J23, CN224/J24, CN225/J25, CN226/J26, CN227/J27 and CN228/J28 at the lower part of C258MAIN.
4. Remove six screws at four corners and the middle of the upper and lower peripheral part of C258MAIN.
5. Grab C258MAIN by the Rear Panel attached to the board and the right edge of the board. Pull the board away from the printer to disconnect the connector on the back side of the board.
6. Take the board out of the Shield Assembly Bottom (E) sliding it backward (to the left).

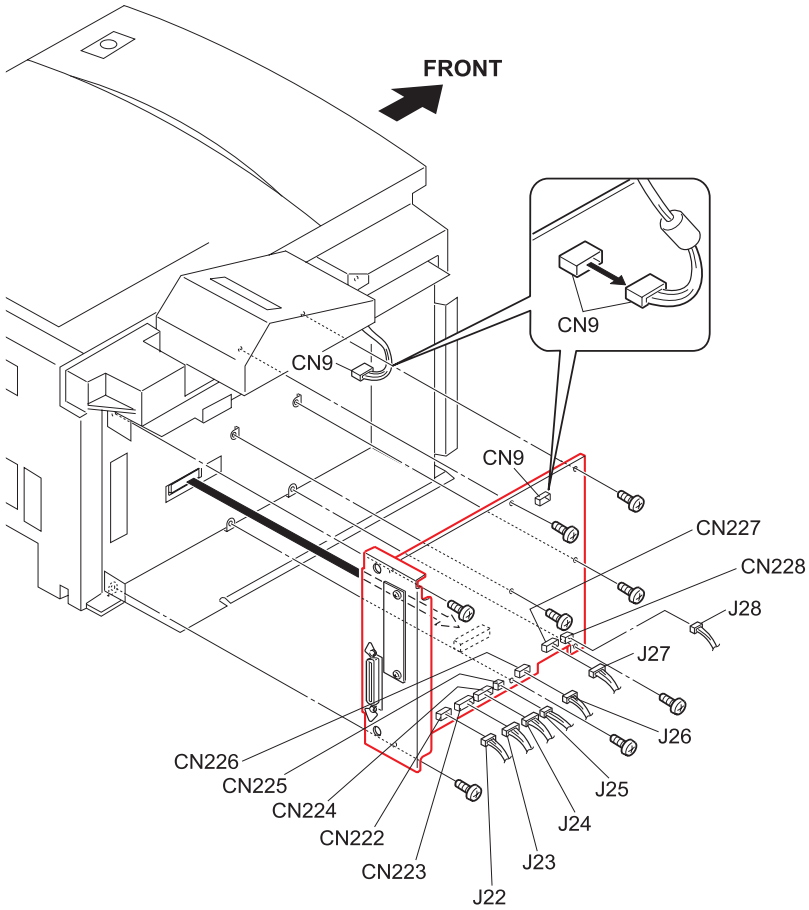


Figure 4-55. "C258MAIN" Removal

4.3.50 Latch R and Latch L

1. Remove the screw that secures the Latch L to the Shaft Latch.
2. Pull the Latch L off of the Shaft Latch.
3. Remove the screw that secures the Latch R to the Shaft Latch.
4. Pull the Latch R off of the Shaft Latch.

CHECK POINT

Be careful not to lose the Spring Latch .

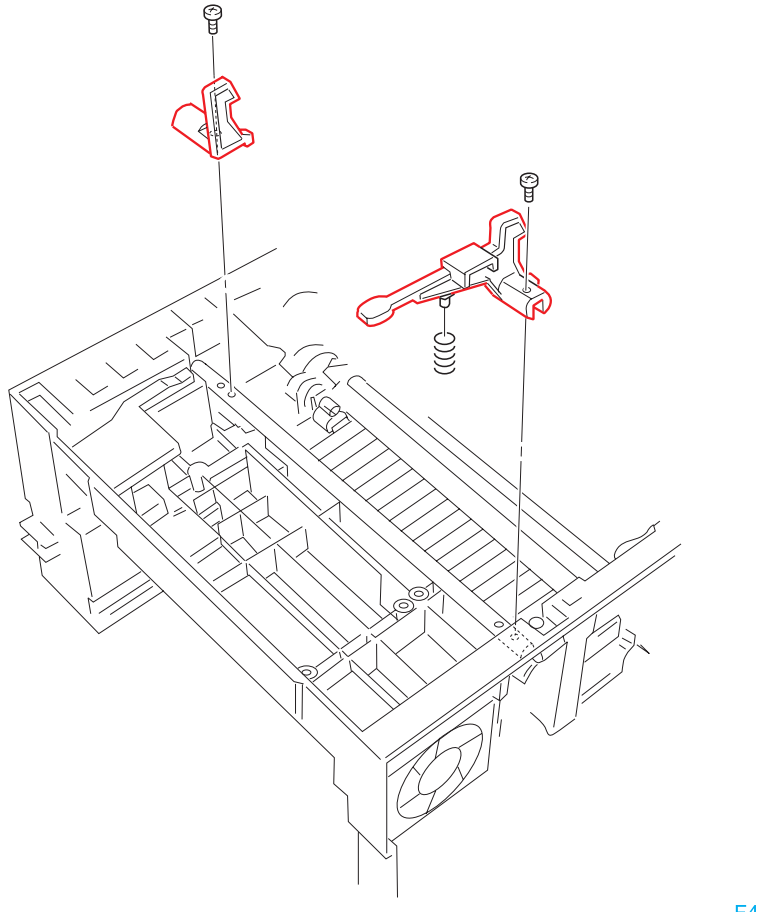


Figure 4-56. “Latch R/L” Removal

4.3.51 Shaft Latch

1. Remove Latch R and Latch L.

2. Slide the Shaft Latch to the right (to the fan-side) out of the hole in the Printer Frame.

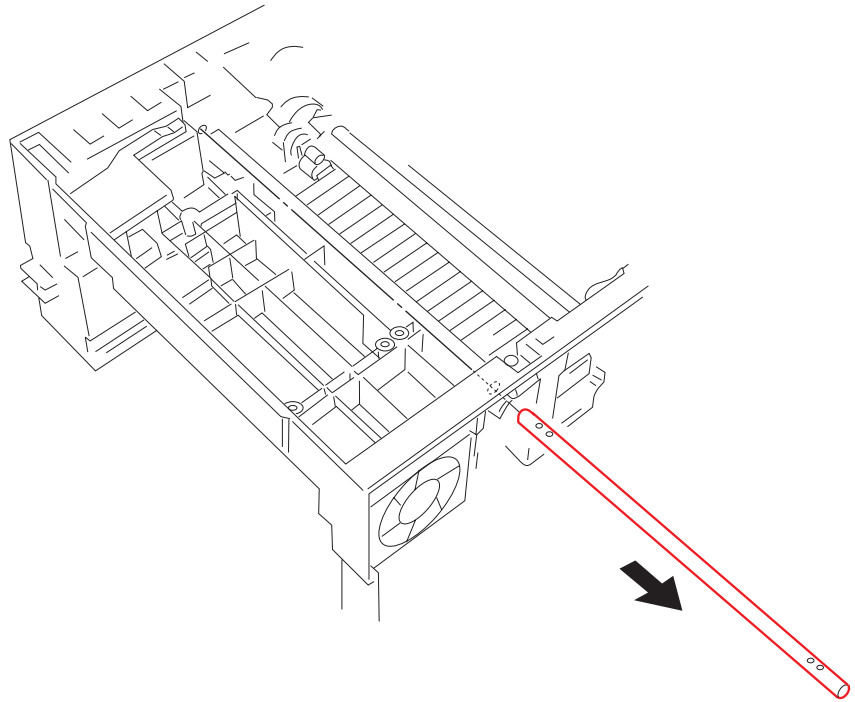


Figure 4-57. “Shaft Latch” Removal

4.3.52 Guide R (A) and (B)

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Disconnect J221 (Toner Sensor) from the HPS (1).
7. Remove the four screws that secure the Guide Actuator to the Printer Frame and remove the Guide Actuator (2).
8. Unhook the Spring and remove it.
9. Slide the Guide R (A) and (B) out of the slot in the Printer Frame.

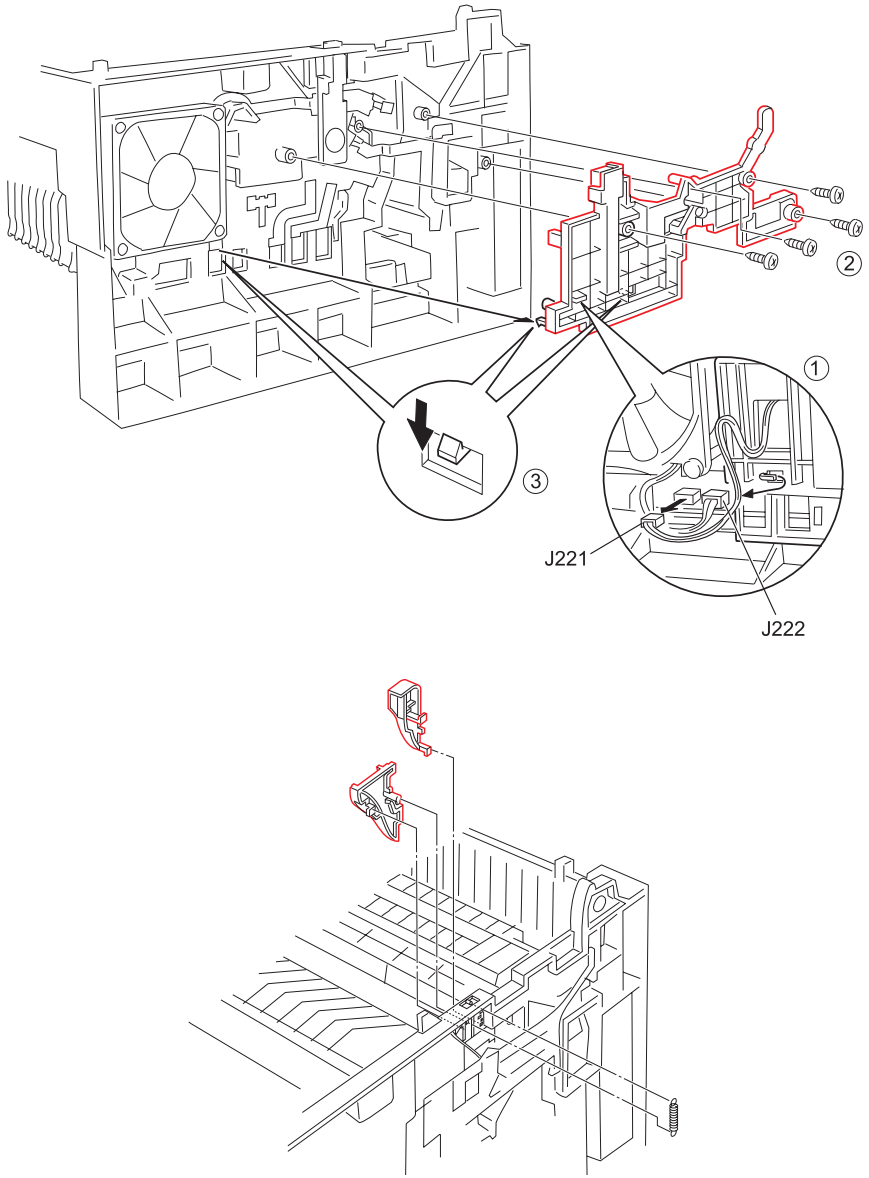


Figure 4-58. “Guide R (A)/(B)” Removal

4.3.53 Guide CST R

1. Remove the Cover Side,E. (Section 4.2.1)
2. Remove the Control Assembly Panel (E). (Section 4.2.3)
3. Remove the Cover Assembly MBF.E.(Section 4.2.4)
4. Remove the Tray Assembly MBF.E.(Section 4.2.5)
5. Remove the Cover Assembly,E. (Section 4.3)
6. Set the printer on the left surface.
7. Squeeze together the arms of the top latch that secure the Guide CST R to the Printer Frame and pull the top of the Guide away from the Frame.
8. Repeat step 4 with the remaining five latches in top to bottom order and remove the Guide CST R.

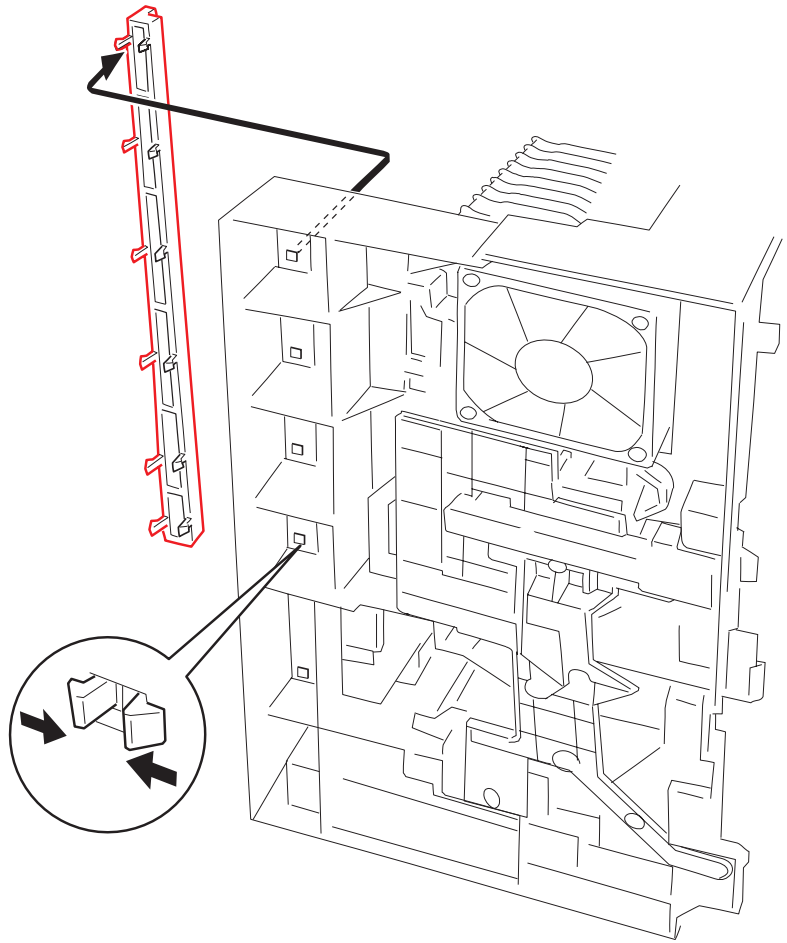


Figure 4-59. “Guide CST R” Removal

CHAPTER

5

ADJUSTMENT

No specific adjustment required on this printer after repair.

CHAPTER

6

MAINTENANCE

6.1 OVERVIEW

This chapter describes the maintenance required by the printer.

6.1.1 User Maintenance

The maintenance item listed in table below should be perrformed by the user.

Item	When Required	Description
Mirror Assy. Cleaning	When irregular image quality appears	Slides the cleaner unit that is built in the Mirror Assy., left and right.

CAUTION

Make sure to return the cleaner unit to the end of the Mirror Unit after cleaning it. (Leaving it in the middle of the Mirror Unit causes abnormal image (vertical white line)).

6.1.2 Service Maintenance

The following item requires a maintenance by the service engineer.

Item	When Required
Fuser Assy.	• Clean the Assy. (Roll Fuser and Roll Press) when abnormal image quality is observed. • If necessary, replace the Fuser Assy. after printing 100,000 pages.

CHAPTER

7

APPENDIX

7.1 Electrical Connection

This section provides a supplemental information about the electrical connetion in the EPL-N1600.

7.1.1 Connectors - C258MAIN

The figure below shows the connectors on the C258MAIN Board.

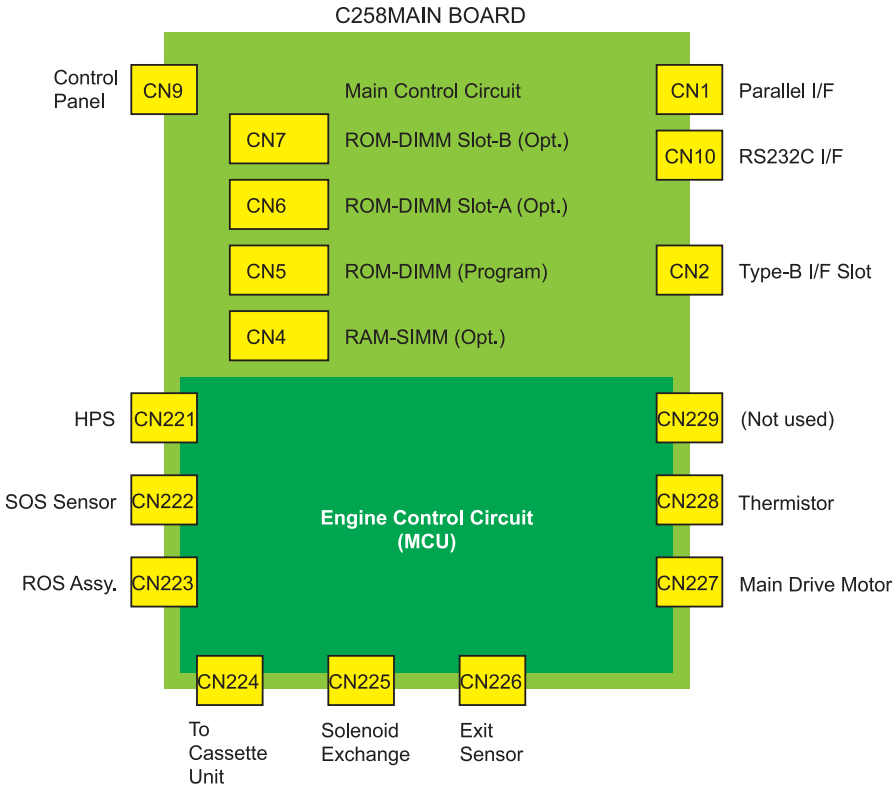


Figure 7-1. Connectors - C258MAIN

7.1.2 Master Wiring Diagram

The Master Wiring Diagram, is divided into the following eight block diagrams. Each block diagram shows the signal names, pin numbers, and other information in detail.

- ☐ HPS - Controller
- ☐ HPS - Imaging Cartridge / Toner Sensor
- ☐ Controller - Laser Diode, ROS Motor, and SOS
- ☐ Controller - Motor Assembly Main, and Solenoid Exchange
- ☐ Controller - Sensor Exit, Sensor Photo, and Thermistor
- ☐ Controller - PWB Assy.-Size1
- ☐ Solenoid Feed, Sensor No Paper MBF, and Solenoid MBF

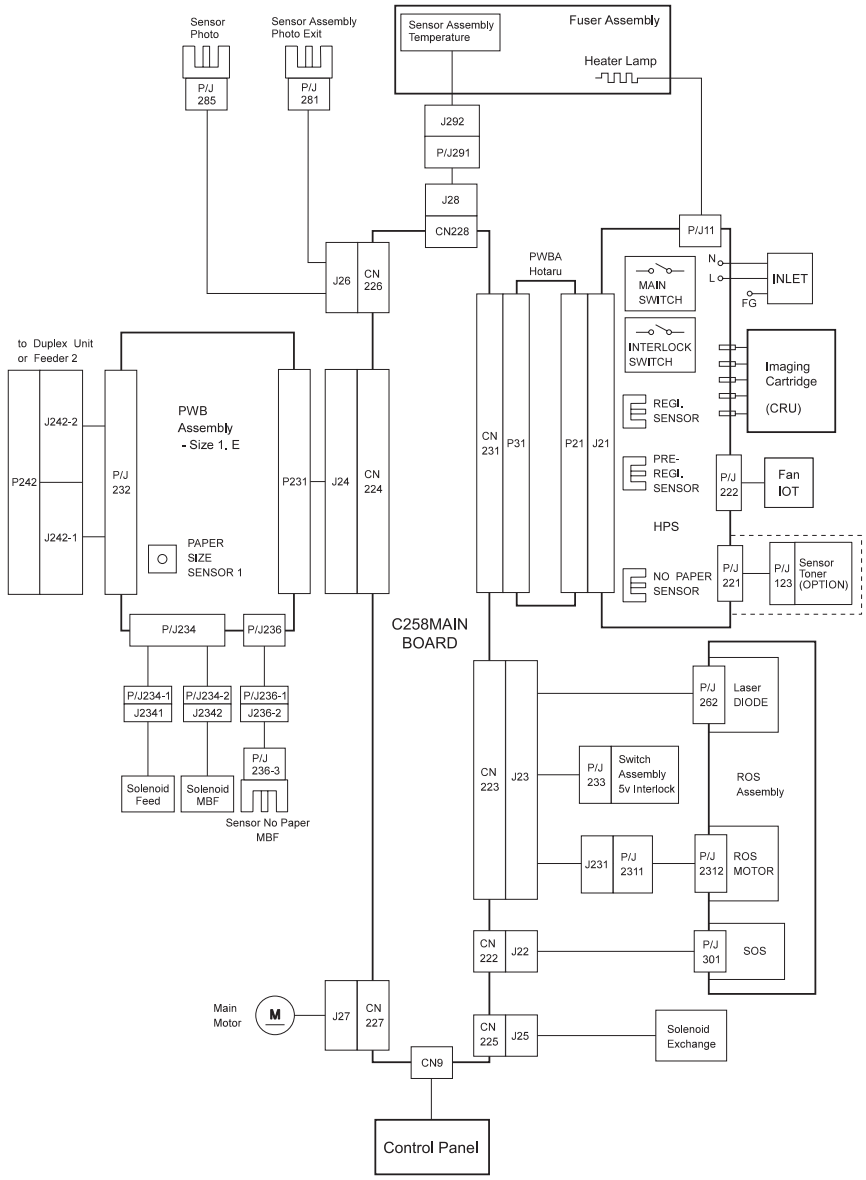
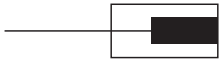
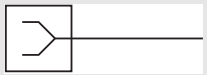
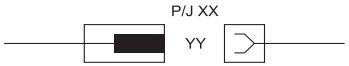


Figure 7-2. Master Wiring Diagram

7.1.2.1 Wiring Diagram Notation

The meaning of the symbols used in the wiring diagram is as listed in table below.

Table 7-1. Wiring Diagram Notation

Symbols	Description
	A plug
	A jack
	Pin YY and Jack YY of connectors Pxx and Jxx.
5VDC	5VDC power supply
24VDC	24VDC power supply
/HEAT (TTL)	• "/" indicates the low-active signal and it goes LOW when it is ON. • "TTL" indicates the signal level and is TTL compatible. (HIGH: 4 to 5VDC / LOW: 0 to 0.8VDC)
/FAN FAST ON(L) xxVDC	• "ON(L)" indicates the signal goes LOW when it is ON. • "xxVDC" indicates the signal level when it is HIGH.

HPS - CONTROLLER

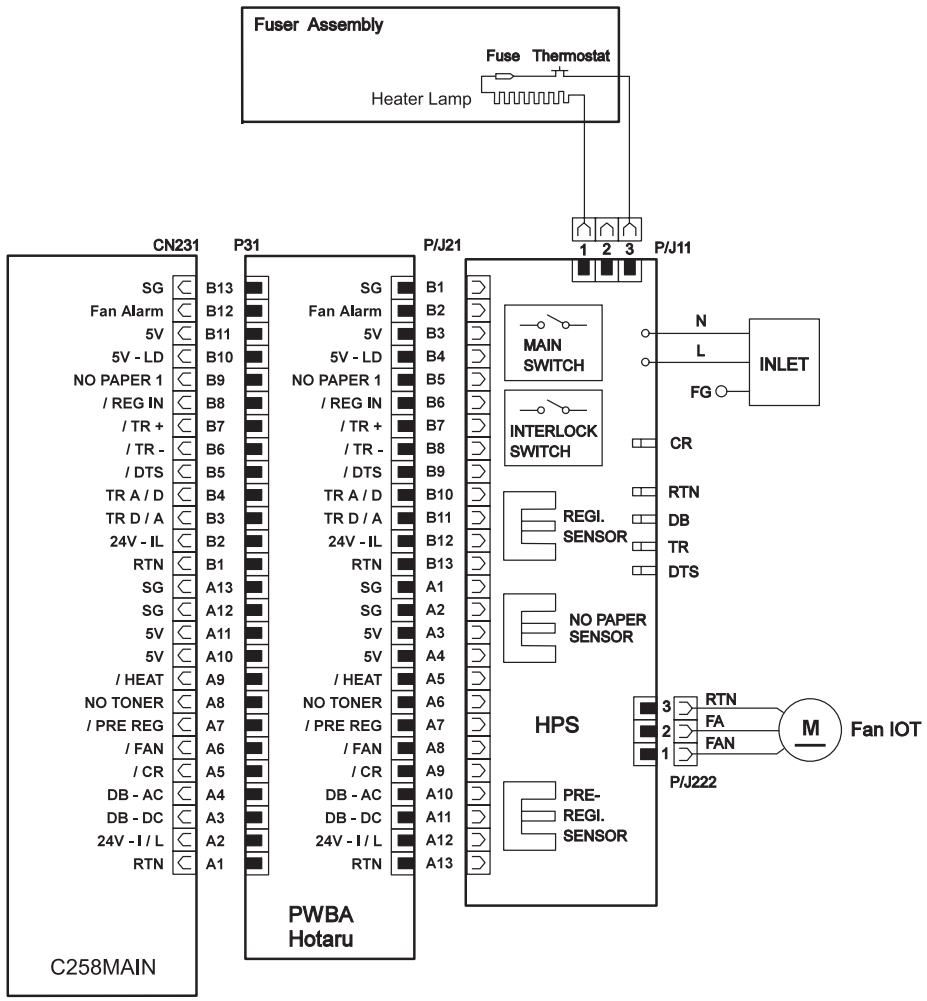


Table 7-2. Signal Names / HPS - Controller

Signal Name	Description
/HEAT	Control signal which switches on and off the Heater Quartz. The Heater Quartz is switched on when this signal is Low and off when High.
NO TONER	Signal from the Sensor Toner in the Cartridge Assembly EP. (CRU). This signal is Low when toner is detected in the Cartridge Assembly EP. (CRU) and High when the toner is not detected (running out).
/PRE REG	Signal from the Sensor Pre-reg. in the P/H section. This signal is High when paper is not detected by the Sensor Pre-reg. and becomes Low when detected.
/CR	Control signal which switches on and off the Bias Charge voltage (DC component) applied to the BCR. The Bias Charge voltage (DC) is not applied when this signal is High and applied when Low.
/FAN	Switches the speed of the Fan IOT between High and Low. When this signal is Low, the driving voltage to the Fan (FAN) is 24 VDC, and the Fan rotates at High speed. When this signal is High, the driving voltage to the Fan (FAN) is 12 VDC, and the Fan rotates at Low speed.
/DB AC	Control signal which switches on and off the Development Bias voltage (AC component) applied to the Mag. Roll. The Development Bias voltage (AC) is not applied when this signal is High and applied when Low.
/DB DC	Control signal which switches on and off the Development Bias voltage (DC component) applied to the Mag. Roll. The Development Bias voltage (DC) is not applied when this signal is High and applied when Low.
Fan Alarm	Monitor signal (Fan Alarm) from the Fan IOT which rises High when the Fan stops.
5V-LD	+5V power supply for driving the LD (interrupted when the Exit Cover is open)
NO PAPER 1	Signal from the Sensor No-paper for Cassette 1. This signal is Low when paper is detected and becomes High when paper is not detected (the Cassette is empty).
/REG IN	Signal from the Sensor Registration. This signal is High when paper is not detected by the Sensor Registration and becomes Low when detected.

Signal Name	Description
/TR+	Control signal which switches on and off the Transfer Bias voltage applied to the BTR. The Transfer Bias voltage is not applied when this signal is High and applied when Low.
/TR-	Signal which switches the polarity of the Transfer Bias voltage. The Transfer Bias voltage is positive when this signal is Low and negative when High.
/DTS	Control signal which switches on and off the voltage to the Detack Saw. The voltage is not applied when this signal is Low and applied when High.
TR A/D	Monitoring signal which indicates the Transfer Bias current to the BTR (Analog signal)
TR D/A	Control signal which determines the value of the Transfer Bias current.

Table 7-3. Pin Assignment / HPS - Controller

P21	Signal Name	Signal Direction M: Controller P: HPS	Trigger	High Level	Low Level
A5	/HEAT	M → P	Level	4~5 VDC	0~0.8 VDC
A6	NO TONER	M ← P	Level	TTL	TTL
A7	/PRE REG	M ← P	Level	TTL	TTL
A8	/CR-DC	M → P	Level	24 VDC	0~0.8 VDC
A9	/CR-AC	M → P	Level	24 VDC	0~0.8 VDC
A10	/DB-AC	M → P	Level	24 VDC	0~0.8 VDC
A11	/DB-DC	M → P	Level	4~5 VDC	0~0.8 VDC
B2	Fan Alarm	M ← P	Level	TTL	TTL
B4	5V-LD	M ← P	-	4~5 VDC	0~0.8 VDC
B5	NO PAPER 1	M ← P	Level	TTL	TTL
B6	/REG IN	M ← P	Level	TTL	TTL
B7	TR	M → P	Level	24 VDC	0~0.8 VDC
B8	TR+/-	M → P	Level	24 VDC	0~0.8 VDC
B9	/DTS	M → P	Level	24 VDC	0~0.8 VDC
B10	TR A/D	M ← P	-	*	*
B11	TR D/A	M → P	-	*	*

HPS - IMAGING CARTRIDGE / TONER SENSOR

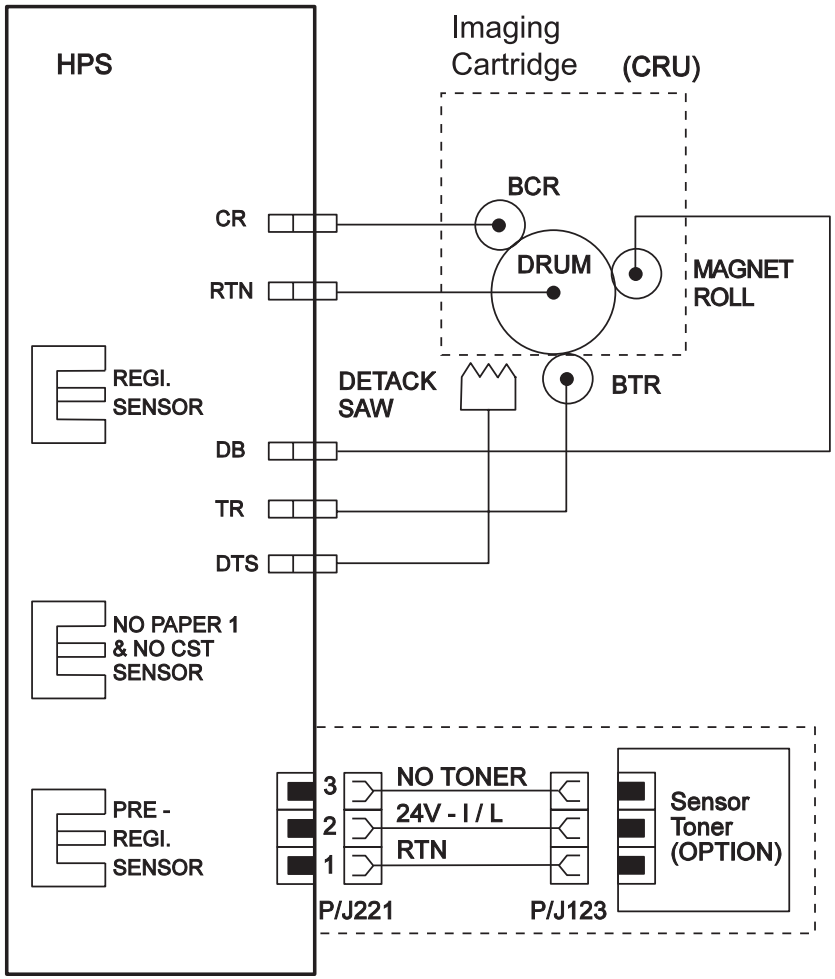


Table 7-4. Signal Names / HPS - Imaging Cartridge

Signal Name	Description	Output Voltage
DB	DC/AC output to the Magnet Roll	DC: –315 V, AC: 1.8 kVp-p, 3.0 kHz
CR	DC/AC output to the BCR	DC: –400 V, AC: 800 µA, 850 Hz
TR	DC output to the BTR (+DC in Transfer, –DC when cleaning)	+DC: 250 V to 6 kV, –DC: -600 V
DTS	DC output to the DTS	DC: -2 kV

Table 7-5. Pin Assignment / HPS - Toner Sensor

P221	Signal Name	Signal Direction S: Sensor P: HPS	Trigger	High Level 4~5 VDC	Low Level 0~0.8 VDC
3	NO TONER	S → P	Level	TTL	TTL

CONTROLLER – ROS ASSY., SOS SENSOR, AND SWITCH ASSY. 5V INTERLOCK

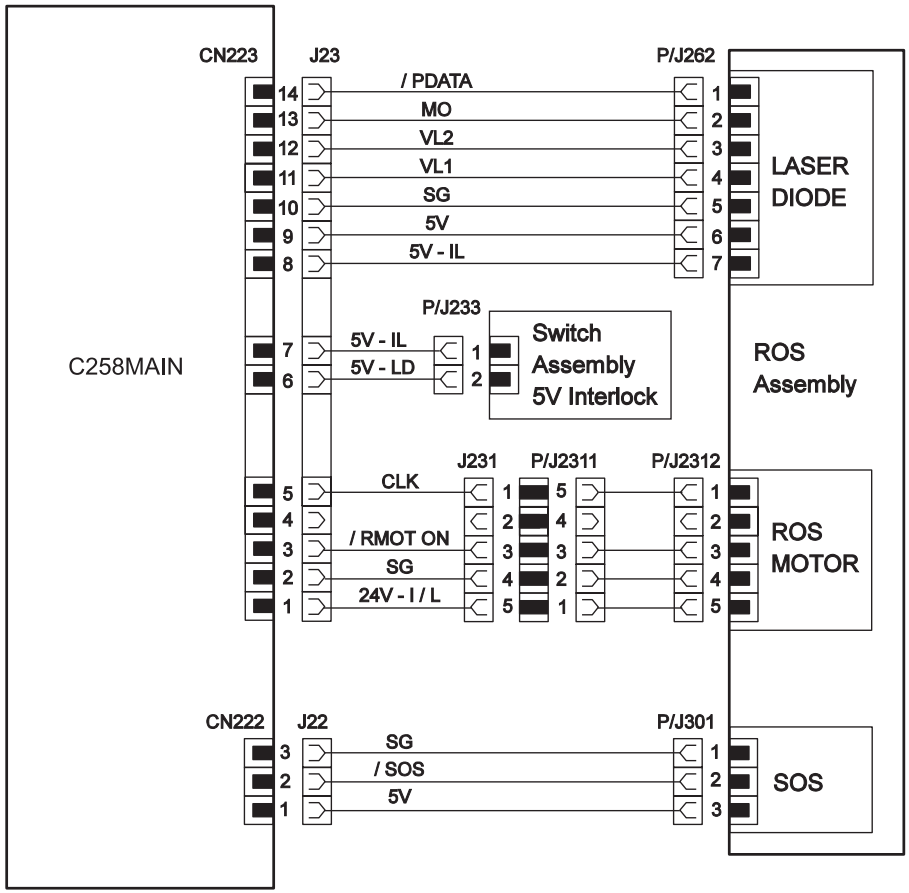


Table 7-6. Signal Names / Controller - ROS Assy., SOS Sensor

Signal Name	Description
/PDATA	Print Image Data (Low = Black dot:, High = White dot)
MO	Monitor signal which feeds back the LD output power (Analog signal)
VL2	Control signal which determines the drive current for the LD (Analog signal)
VL1	Control signal which determines the drive current for the LD (Analog signal)
5V-IL	+5VDC circuit from the Switch Assembly 5V Interlock. The circuit is connected to the Laser Diode driving circuit
5V-LD	+5VDC Laser Diode driving circuit (interrupted by the Interlock Switch when the Exit Cover is open)
CLK	Clock signal used for latching data
/RMOT ON	Control signal which switches on and off the ROS Motor (The ROS Motor is switched on when this signal is Low and off when High)

Table 7-7. Pin Assignment / Controller - ROS Assy.

CN223	P262 or P2312	Signal Name	Signal Direction M: Controller R: ROS	Trigger	High Level	Low Level
14	P262-1	/P. DATA	M → R	Level	TTL	TTL
13	P262-2	MO	M ← R	-	-	-
12	P262-3	VL2	M → R	-	-	-
11	P262-4	VL1	M → R	-	-	-
9	P262-7	5V-LD	M → R	-	5V	0V
3	P2312-3	/RMOT ON	M → R	Level	TTL	TTL

Table 7-8. ROS Motor Specification

Item	Description
Motor Type	DC Brushless motor for dividing thhe Polygon Mirror with a PLL control circuit
Number of poles/ Direction of rotation	3-phase 12 poles / Clockwise (When viewed from the Mirror side)
Speed of rotation of output shaft	20461.11 rpm ± 0.5%
Starting time	4 seconds or less (for rated load at 22 °C)
Starting current	1.0 A or less (rms)
Rated current	0.35 A or less (rms)
Rated voltage	24 VDC ± 10%

Table 7-9. Signal Names / Controller - SOS Sensor

Signal Name	Description
SOS	SOS detection signal. Normally High. Goes Low when the laser beam strikes the SOS.

Table 7-10. Pin Assignment / Controller - SOS Sensor

CN222	P301	Signal Name	Signal Direction M: Controller R: ROS	Trigger	High Level	Low Level
2	2	/SOS	M ← R	Level	TTL	TTL

CONTROLLER – MOTOR ASSY MAIN, AND SOLENOID EXCHANGE

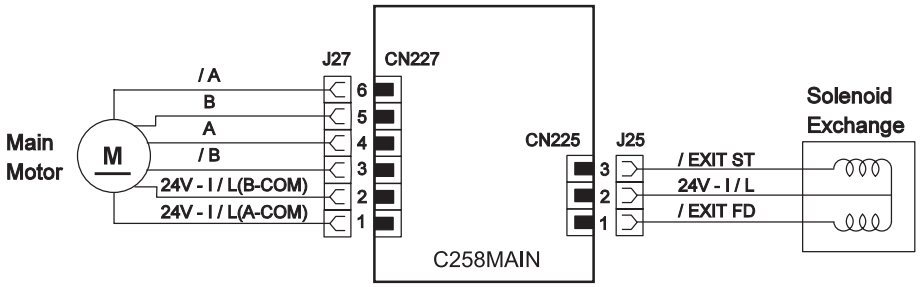


Table 7-11. Motor Assy. MAIN Specification

Item	Description
Motor Type	Permanent magnet steppting motor (Hybrid)
Step angle	1.8 ± 0.04 degrees
Speed of rotation	2853.9 pps (pulses per second)
DC resistance of motor windings	2.2 Ω per phase ± 10% (at ambient temperature of 25 °C)

Table 7-12. Solenoid Exchange Specifications

DC resistance	77.814 Ω ± 10% (measured between P25-1 and P25-2 and between P25-2 and P25-3)

Table 7-13. Signal Names / Controller – Motor Assy Main

Signal Name	Description
/A	Phase /A drive signal for the Main Motor (Low when driving, and High when not driving)
B	Phase B drive signal for the Main Motor (Low when driving, and High when not driving)
A	Phase A drive signal for the Main Motor (Low when driving, and High when not driving)
/B	Phase /B drive signal for the Main Motor (Low when driving, and High when not driving)

Table 7-14. Pin Assignment / Controller – Motor Assy. Main

CN227	Signal Name	Signal Direction MM: Main Motor M: Controller	Trigger	High Level	Low Level
6	/A	MM ← M	Level	24V	0V
5	B	MM ← M	Level	24V	0V
4	A	MM ← M	Level	24V	0V
3	/B	MM ← M	Level	24V	0V

Table 7-15. Siganl Names / Controller - Solenoid Exchange

Signal Name	Description
/EXIT FD	Signal which actuates the Solenoid Exchange to switch paper exit path. Low: Switches the paper path to the Duplex Unit or the Face Up Catch Tray when any of them is installed. High: Does not change the paper path
/EXIT ST	Signal which actuates the Solenoid Exchange to switch paper exit path. Low: Switches the paper path to the exit of the Base Engine High: Does not change the paper path

Table 7-16. Pin Assignment / Controller - Solenoid Exchange

CN225	Signal Name		Trigger	High Level	Low Level
1	/EXIT FD	M → E	Level	24V	0V
3	/EXIT ST	M → E	Level	24V	0V

CONTROLLER – SENSOR EXIT, SENSOR PHOTO, AND THERMISTOR

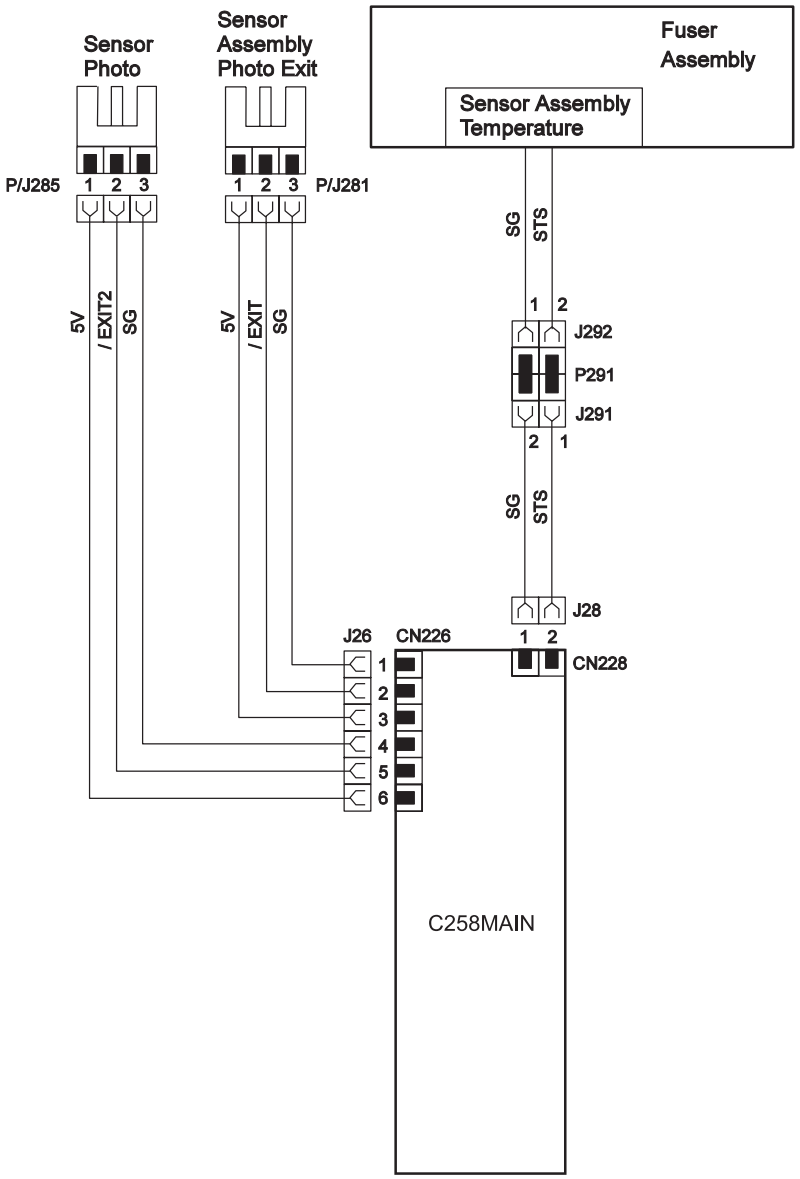


Table 7-17. Signal Names / Sensor Exit, Sensor Photo, Thermistor

Signal Name	Description
/EXIT	Signal from the Sensor Exit. This signal is Low when the Sensor Assembly Photo Exit is actuated by paper, and High when the Sensor Assembly Photo Exit is deactuated.
/EXIT2	Signal from the Exit2 Sensor. This signal is Low when the Exit2 Sensor is actuated by paper, and High when the Sensor Photo is deactuated.

Table 7-18. Pin Assignment / Controller - Sensro Exit/Photo

CN226	P281 or P285	Signal Name	Signal Direction M: Controller S: Sensor	Trigger	High Level	Low Level
2	P281-2	/EXIT	M ← S	-	TTL	TTL
5	P285-2	/EXIT2	M ← S	-	TTL	TTL

Table 7-19. Signal Names / Controller - Thermistor

Signal Name	Description
STS*	Signal from the Thermistor which monitors the temperature of the Fuser Heat Roll (Analog signal)

*: STS (Soft Touch Sensor)

Table 7-20. Pin Assignment / Controller - Thermistor

CN228	J291	J292	Signal Name	Signal Direction M: Controller S: Sensor	Trigger	High Level	Low Level
2	1	2	STS	M ← S	-	-	-

Table 7-21. Thermistor Specification

Temperature (°C)	20	30	184
Resistance (Ω)	438.3	302.3	6.532

CONTROLLER – PWB ASSEMBLY-SIZE 1

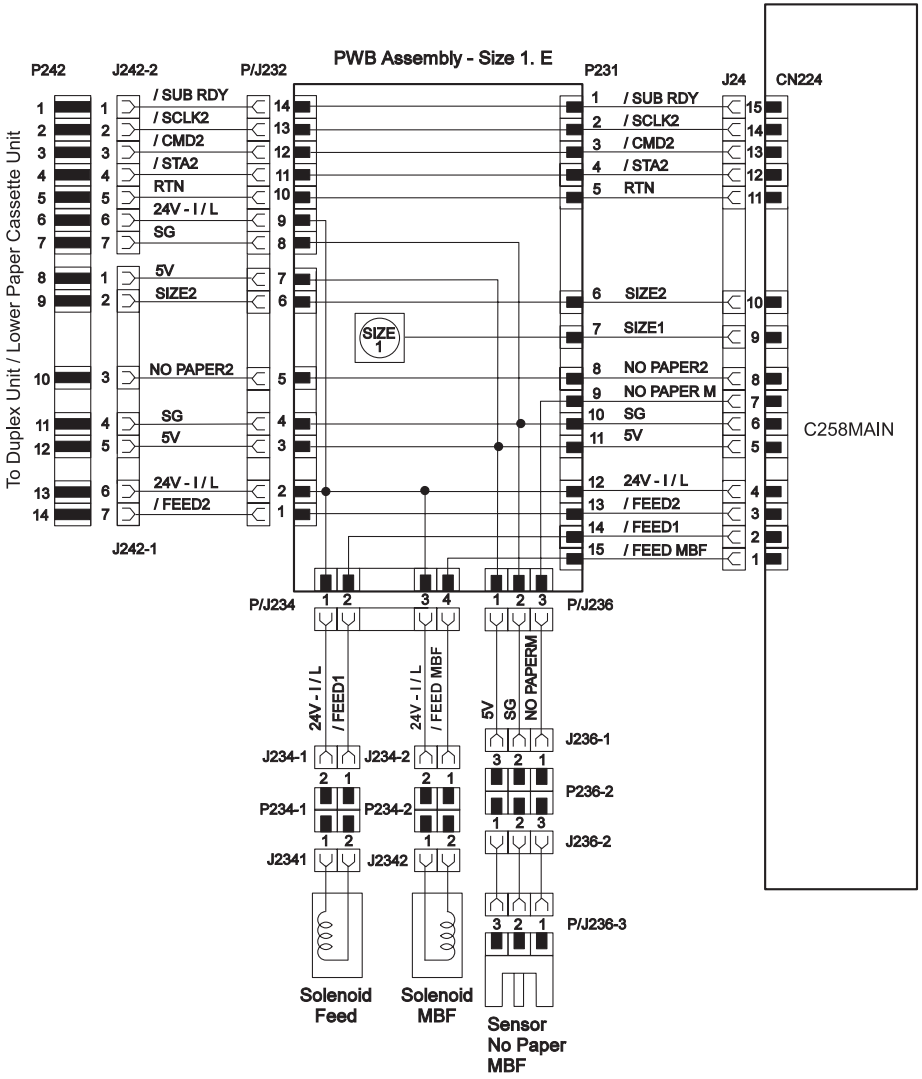


Table 7-22. Signal names / Controller - PWB Assy. Size-1

Signal Name	Description
/SUB RDY	Signal which indicates the status of the Duplex Unit. This signal is Low when the Duplex Unit is ready and High when not ready.
/SCLK2	Clock signal for synchronized transmission of Command (/CMD2 below) and Status (/STA2 below) between the Duplex Unit and the Controller
/CMD2	Command signal to the Duplex Unit
/STA2	Status signal from the Duplex Unit
SIZE2	Signal which indicates the size of the paper in Cassette 2 (Analog signal)
SIZE1	Signal which indicates the size of the paper in Cassette 1 (Analog signal)
NO PAPER2	Signal from the Sensor No Paper Feed 2. This signal is High when there is paper in the Cassette and Low when there is not.
NO PAPER M	Signal from the Sensor No Paper MBF. This signal is High when there is paper on the MBF and Low when there is not.
/FEED2	Signal for actuating the Solenoid Feed 2 which starts feeding of paper in Cassette 2.
/FEED1	Signal for actuating the Solenoid Feed which starts feeding of paper in Cassette 1.
/FEED MBF	Signal for actuating the Solenoid MBF which starts feeding of paper on the MBF.

Table 7-23. Pin Assignment / Controller - PWB Assy. Size-1

CN224	P231	Signal Name	Signal Direction M: Controller P: PWB Assembly-Size 1	Trigger	High Level	Low Level
15	1	/SUB RDY	M ← P	Level	TTL	TTL
14	2	/SCLK2	M → P	Level	TTL	TTL
13	3	/CMD2	M → P	Level	TTL	TTL
12	4	/STA2	M ← P	Level	TTL	TTL
10	6	SIZE2	M ← P	-	-	-
9	7	SIZE1	M ← P	-	-	-
8	8	NO PAPER2	M ← P	Level	TTL	TTL
7	9	NO PAPERM	M ← P	Level	TTL	TTL
3	13	/FEED2	M → P	Level	24 V	0 V
2	14	/FEED1	M → P	Level	24 V	0 V
1	15	/FEED MBF	M → P	Level	24 V	0 V

Table 7-24. Pin Assignment / PWB Assy. Size-1 - Solenoid Feed1

P234	J2341	Signal Name	Signal Direction P: PWB Assembly-Size 1 SF: Solenoid Feed	Trigger	High Level	Low Level
2	2	/FEED1	P ← SF	Level	24V	0V

Table 7-25. Pin Assignment / PWB Assy. Size-1 - Solenoid MBF

P234	J2342	Signal Name	Signal Direction P: PWB Assembly-Size 1 SM: Solenoid MBF	Trigger	High Level	Low Level
4	2	/FEED MBF	P ← SM	Level	24V	0V

Table 7-26. Pin Assignment / PWB Assy. Size-1 - Sensor No Paper MBF

P236	P236-3	Signal Name	Signal Direction P: PWB Assembly-Size 1 SM: Sensor No Paper MBF	Trigger	High Level	Low Level
3	1	/NO PAPER M	P ← SM	Level	TTL	TTL

Table 7-27. Solenoid Feed Specifications

DC resistance	90 Ω ± 10% at 20 °C

Table 7-28. Solenoid MBF Specifications

DC resistance	90 Ω ± 10% at 20 °C

The table below shows the relationship between paper size, combination of paper size switch operation and a corresponding voltage level of SIZE signal.

Table 7-29. SIZE Signal Voltage

Paper Size		Paper Size Switch *1			Signal Voltage (VDC)
		SW1	SW2	SW3	
Lower Paper Cassette Unit (Standard)	No cassette	0	0	0	0.00
	B5 (SEF) *2	1	0	0	1.20
	Executive	1	0	1	2.50
	Letter (SEF)	0	0	1	2.02
	A4 (SEF)	0	1	1	2.72
	Legal (13”)	1	1	0	2.26
	Legal (14”)	1	1	1	3.01
Lower Paper Cassette Unit (Option)	No cassette	0	0	0	0.45
	Letter (SEF)	0	0	1	2.19
	A4 (SEF)	0	1	1	2.82
	Legal (13”)	1	1	0	2.40
	Legal (14”)	1	1	1	3.08

*1: “0”= Switch is not pressed.
“1”= Switch is pressed.

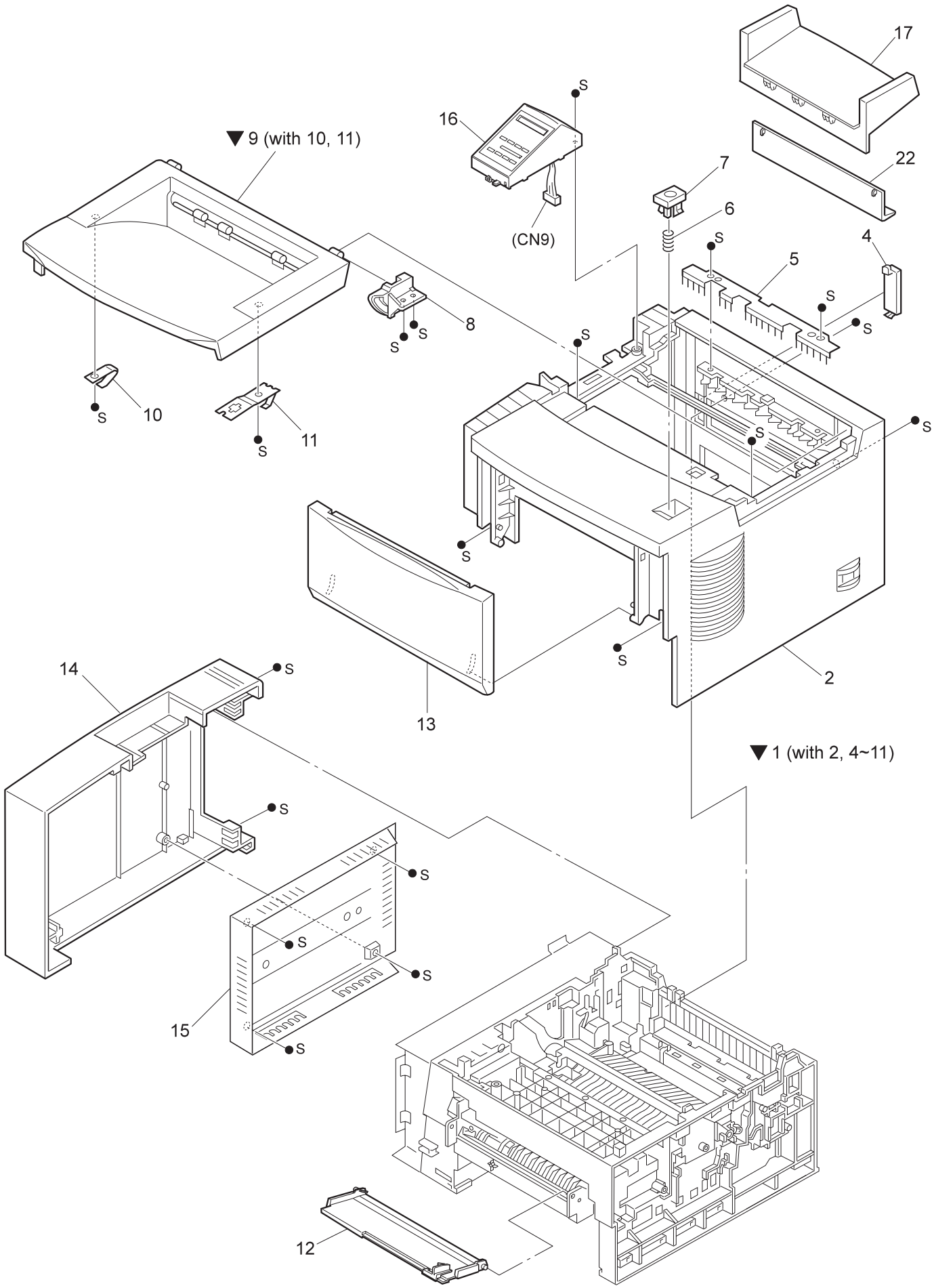
*2: “SEF”=Short edge feed

7.2 Exploded Diagram

This section provides exploded diagram of each part of engine mechanism of the EPL-N1600.

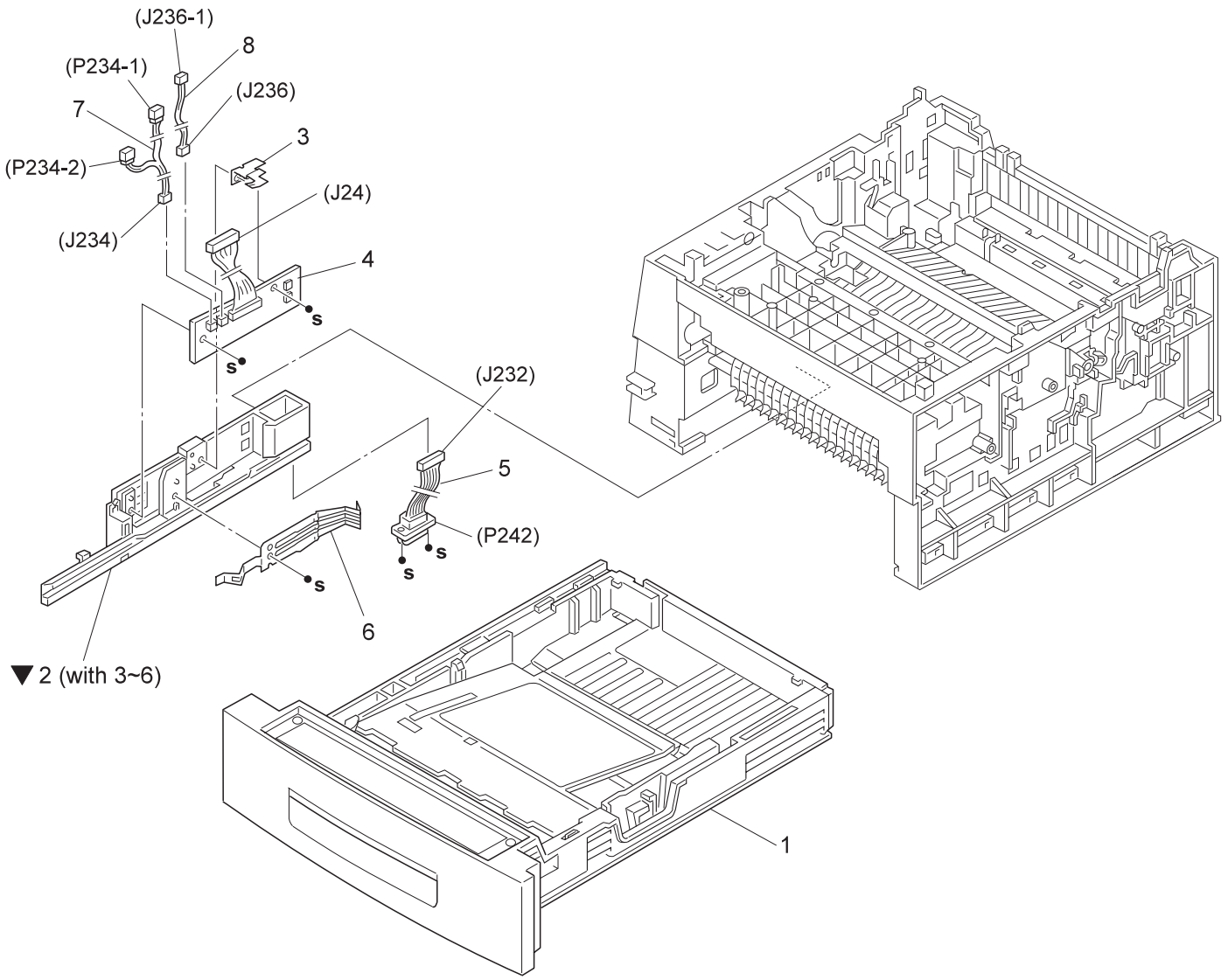
COVERS

1. Cover Assembly,E (with 2, 4~11)
2. Cover Main,E
3. --
4. Cap Main
5. Eliminator
6. Spring Button
7. Button Latch,E
8. Bracket Hinge,E
9. Cover Assembly Exit,E (with 10, 11)
10. Spring Assembly L
11. Spring Assembly R
12. Tray Assembly MBF.E $
13. Cover Assembly MBF.E$
14. Cover Side,E $
15. Shield Assembly Top.ST
16. Control Assembly Panel (E) $
17. Face Up Catch Tray (OPTION) $
18. --
19. --
20. Kit Cover Exit E (with 8~11) $
21. Kit Cover Main E (with 2, 5~7) $
22. Guard Exit


17
22
16
S
▼9 (with 10, 11)
7
6
(CN9)
4
5
8
10
11
2
13
14
15
12
▼1 (with 2, 4~11)

PAPER CASETTE

1. Cassette Epson
2. Sensor Assembly-Size 1.E (with 3~6) $
3. Plate Earth
4. PWB Assembly-Size 1.E
5. Harness Assembly Option
6. Spring Size
7. Harness Solenoid
8. Harness Assembly MBF


(J236-1)
8
(P234-1)
(J236)
7
3
(P234-2)
(J24)
(J234)
4
S
S
(J232)
5
(P242)
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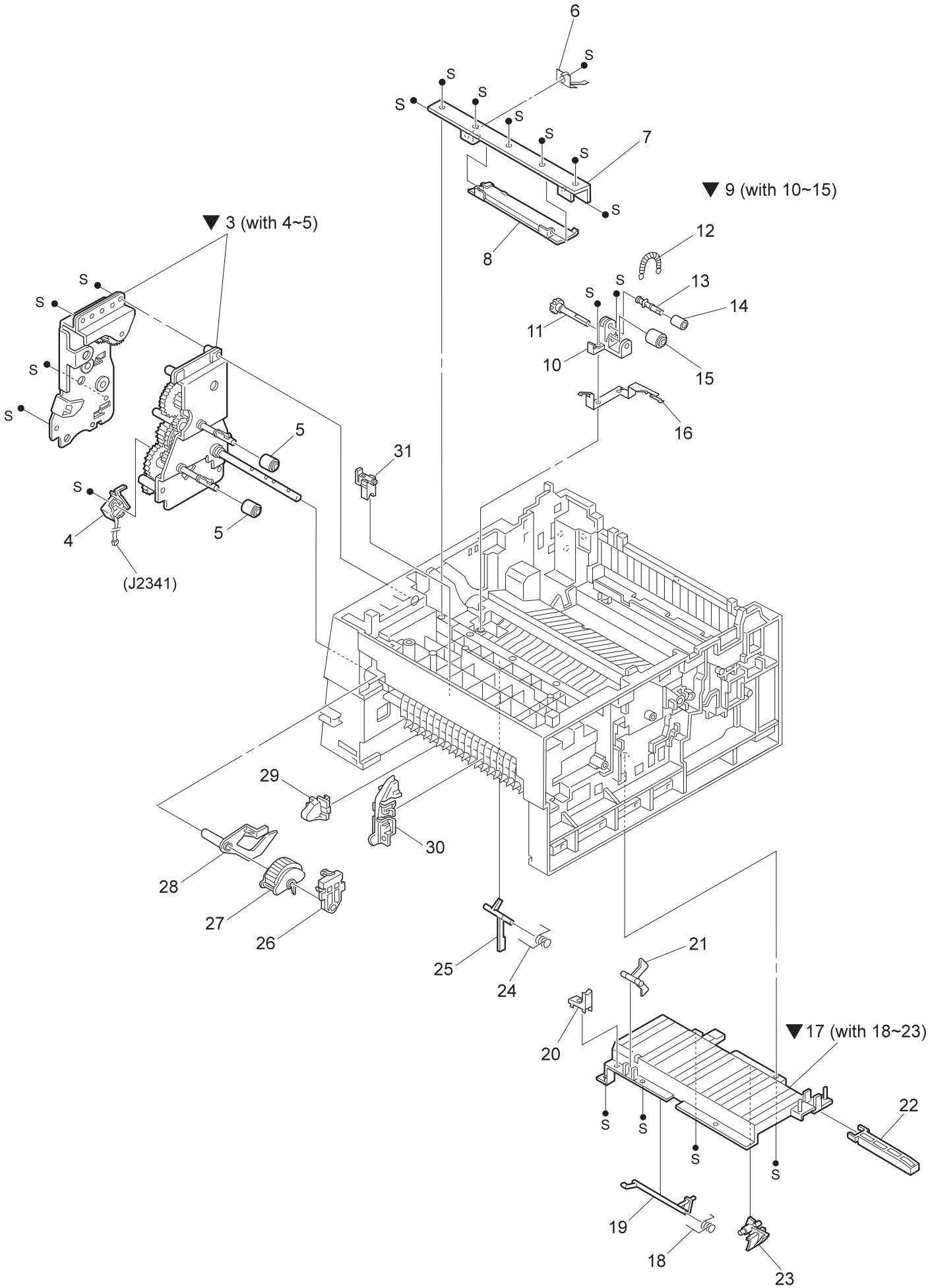
S
S
6
▼2 (with 3~6)
1

PAPER TRANSPORTATION (I)

1. --
2. --
3. Drive Assembly (with 4~5) $
4. Solenoid Feed $
5. Roll Assembly Turn $
6. Plate Earth Chute
7. Angle
8. Chute Inlet Registration
9. Roll Assembly Registration (with 10~15) $
10. Holder Registration
11. Gear Registration
12. Spring NIP Registration
13. Shaft Pinch Registration
14. Roll Pinch Registration
15. Roll Registration Assembly
16. Plate Contact Inlet
17. Kit Chute Registration Assembly (with 18~23) $
18. Spring Sensor Pre-Registration
19. Actuator Pre-RegistrationB
20. Bearing Pre-Registration
21. Actuator Pre-RegistrationA
22. Link Interlock Switch
23. Cam Interlock Switch
24. Spring Sensor Registration
25. Actuator Registration
26. Bearing Feed
27. Roll Assembly Feed $
28. Actuator No Paper $
29. Bearing Turn
30. Chute Rib
31. Bearing MBF R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8
▼ 9 (with 10~15)
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▼ 3 (with 4~5)
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(J2341)
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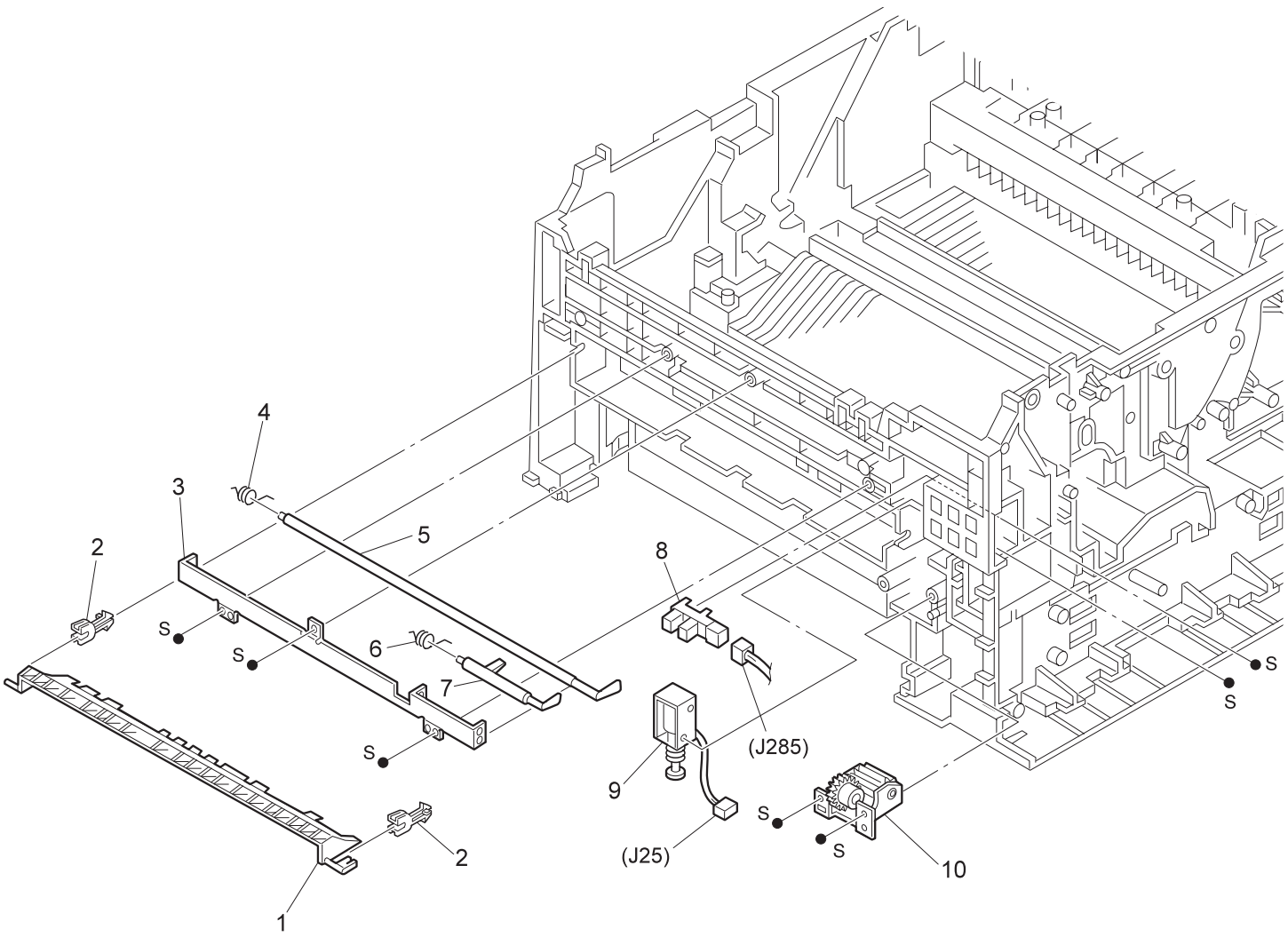
25
24
21
20
▼17 (with 18~23)
22
19
18
23

PAPER TRANSPORTATION (I) REAR

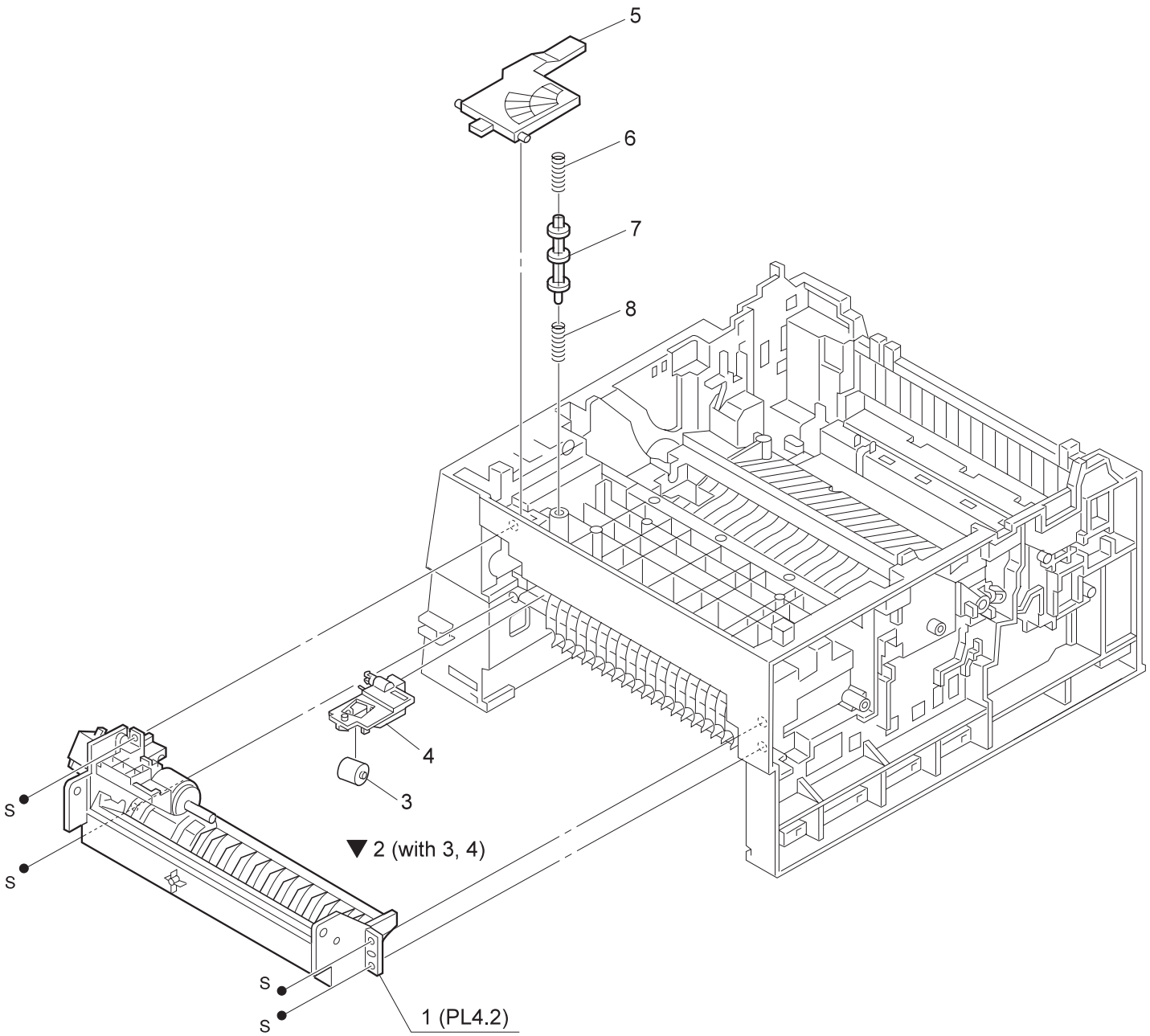
1. Chute Exchange
2. Cap Chute Exchange
3. Plate Base Actuator
4. Spring Exit-2/L
5. Actuator Exit-2/L
6. Spring Exit-2/S
7. Actuator Exit-2/S
8. Sensor Photo $
9. Solenoid Exchange $
10. Gear Duplex Assembly
11. Kit Chute Exchange (with 1~2) $



▼ 11 (with 1, 2)

PAPER TRANSPORTATION (II)

1. Reference only (Exploded on PL4.2)
2. Roll Assembly Pinch Pre-Registration (with 3, 4)
3. Roll Pinch Pre-Registration
4. Holder Pinch Pre-Registration
5. Lever Jam Clear $
6. Spring-Hold Rod
7. Stopper Rod
8. Spring NIP Pre-Registration


5
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4
3
▼2 (with 3, 4)
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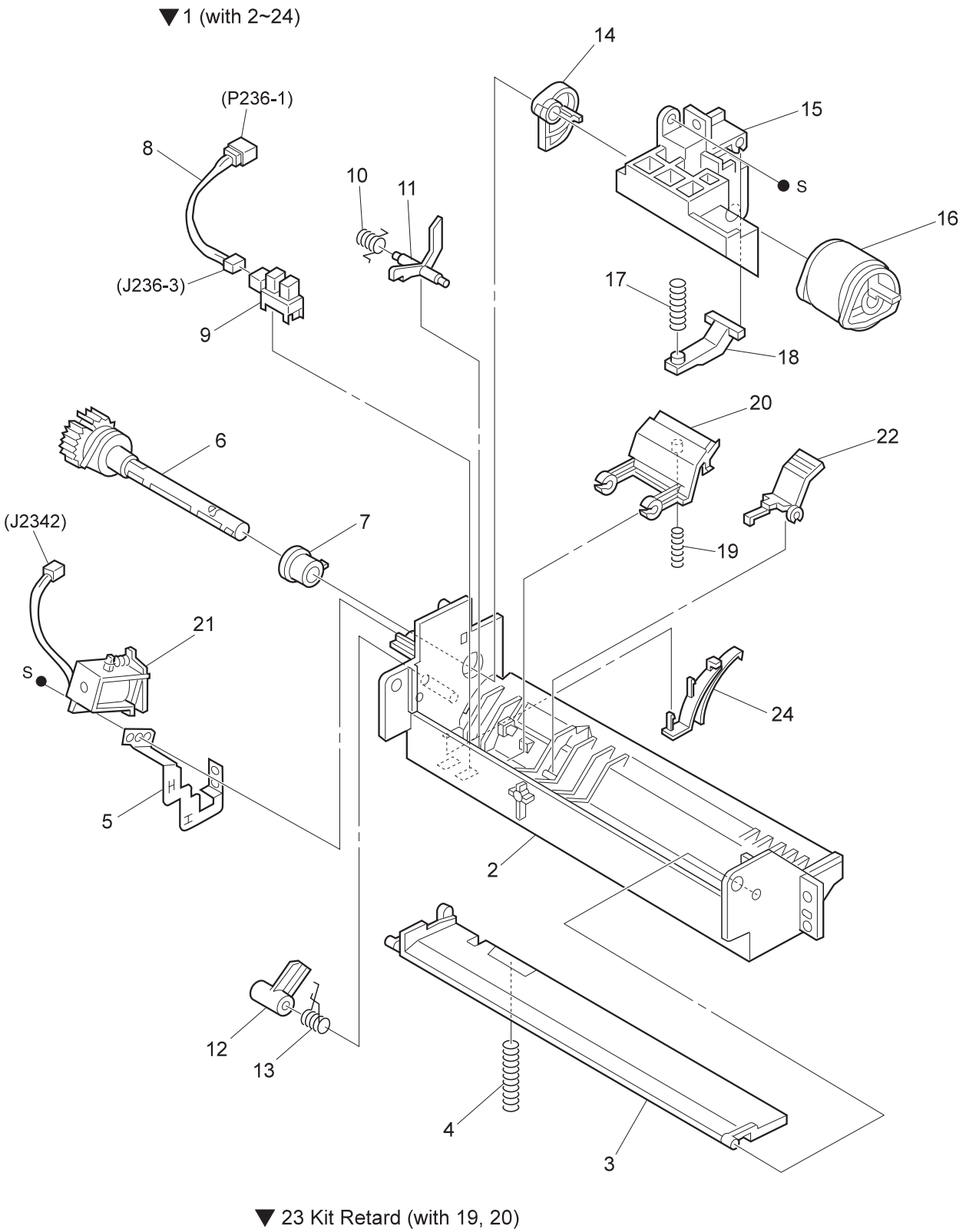
1 (PL4.2)

MBF

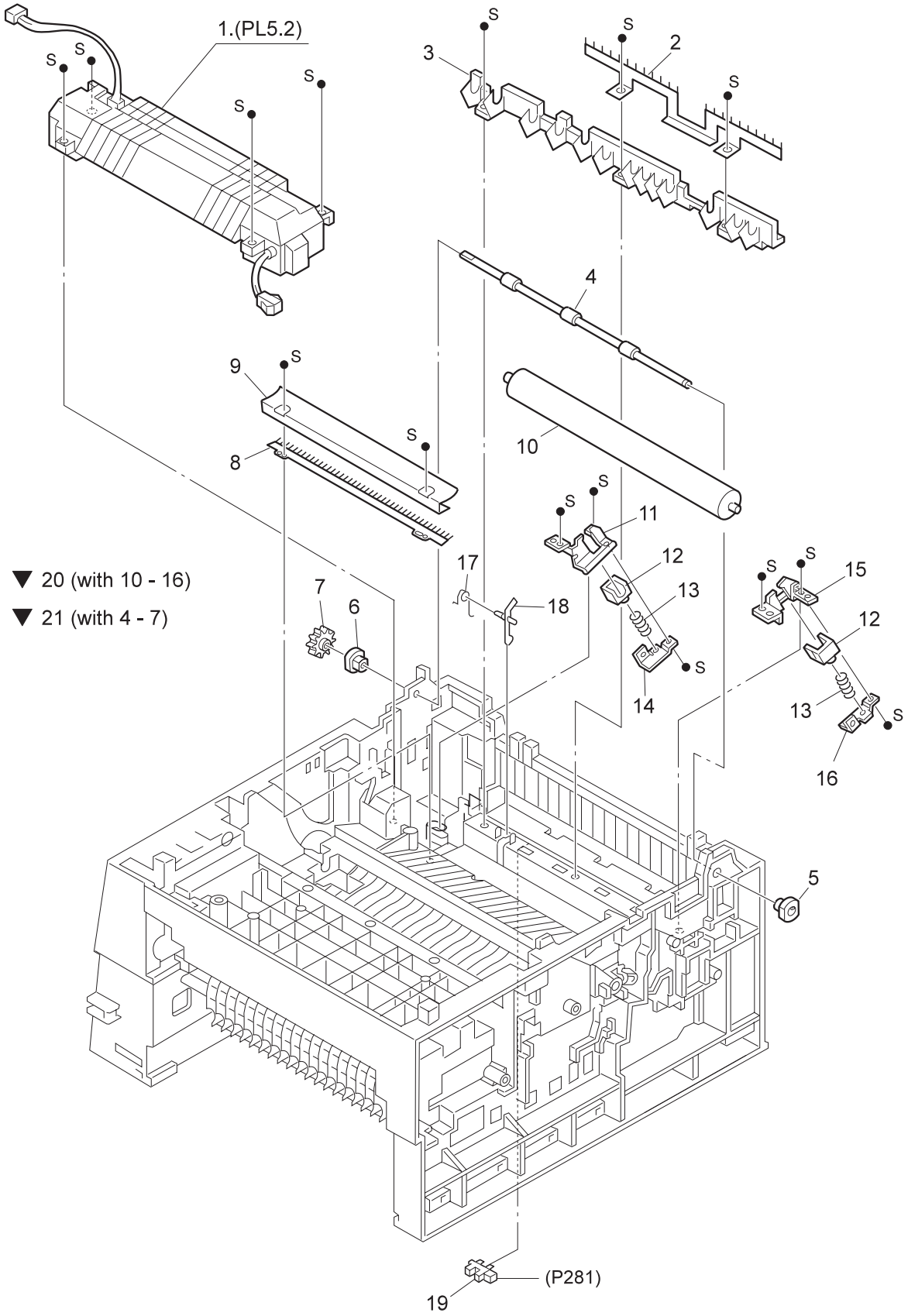
1. Frame Assembly MBF (with 2~24) $
2. Frame MBF
3. Plate Assembly Bottom MBF
4. Spring Normal Force MBF
5. Plate Earth
6. Gear Assembly MBF
7. Bearing MBF
8. Harness Sensor MBF
9. Sensor No Paper MBF $
10. Spring Sensor MBF
11. Actuator Sensor MBF
12. Lever Gear
13. Spring Lever Gear
14. Cam MBF
15. Holder Gear MBF
16. Roll Assembly MBF $
17. Spring Lever MBF
18. Lever MBF
19. Spring Retard
20. Pad Assembly Retard
21. Solenoid MBF $
22. Stopper Paper
23. Kit Retard (with 19 and 20) $
24. Guide Registration MBF



▼23 Kit Retard (with 19, 20)

FUSING & PAPER EXIT

1. Reference only (Exploded on PL5.2)
2. Eliminator
3. Chute Exit Pressure Roll
4. Roll Assembly Exit Out
5. Bearing-Exit Roll SP
6. Bearing-Exit Roll
7. Gear Exit Out
8. Eliminator
9. Chute-Inlet
10. Roll-Press
11. NIP Lever,L
12. Bearing-Pressure Roll
13. Spring NIP
14. Plate Assembly-Base Pressure Roll,L
15. NIP Lever,R
16. Plate Assembly-Base Pressure Roll,R
17. Spring-Exit
18. Actuator-Exit
19. Sensor Assembly Photo Exit $
20. Kit Pressure Roll (with 10~16) $
21. Kit Exit Roll (with 4~7) $


1.(PL5.2)
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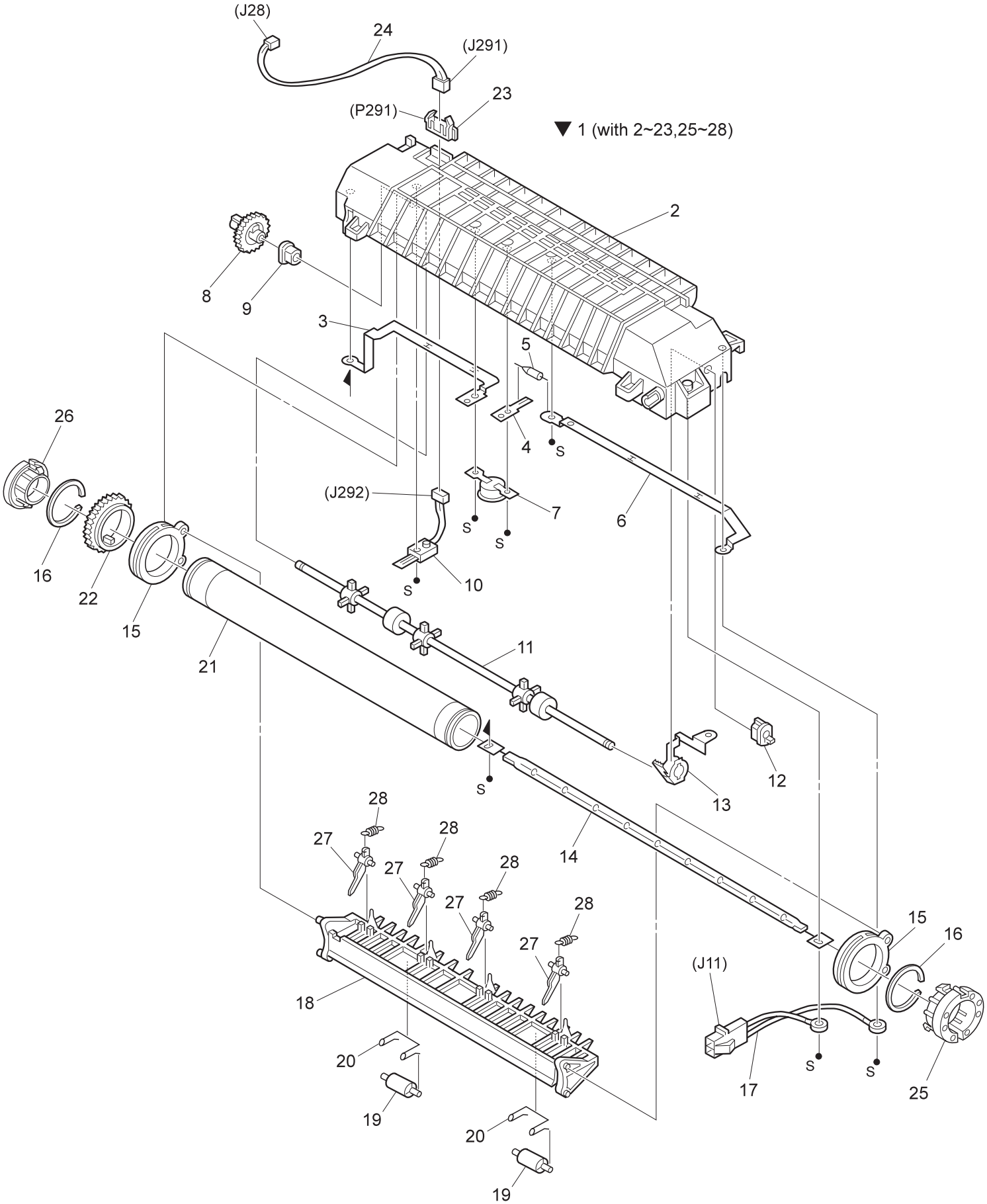
19
(P281)
▼ 20 (with 10 - 16)
▼ 21 (with 4 - 7)

FUSER UNIT

1. Fuser Assembly (with 2~23,25~28) $
2. Frame-Fuser
3. Plate-AC B
4. Plate Fuse
5. Fuse
6. Plate-AC A
7. Thermostat
8. Gear-Exit
9. Bearing-Exit Roll
10. Sensor Assembly Temperature
11. Roll Assembly Exit
12. Bearing Exit Roll SP
13. Spring-Ground, Heat Roll
14. Heater Quartz
15. Bearing Heat Roll
16. Ring-Roller
17. Connector Assembly
18. Chute-Exit Heat Roll
19. Roll-Pinch
20. Spring Pinch
21. Roll Fuser
22. Gear Heat Roll
23. Connector Panel Header M12
24. Harness Assembly STS-HE
25. Cap-Heat Roll,R
26. Cap-Heat Roll,L
27. Finger Assembly
28. Spring-Finger


(J28)
24
(J291)
23
(P291)
▼ 1 (with 2~23,25~28)
2
8
9
3
5
4
S
26
(J292)
7
6
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16
22
15
10
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16
(J11)
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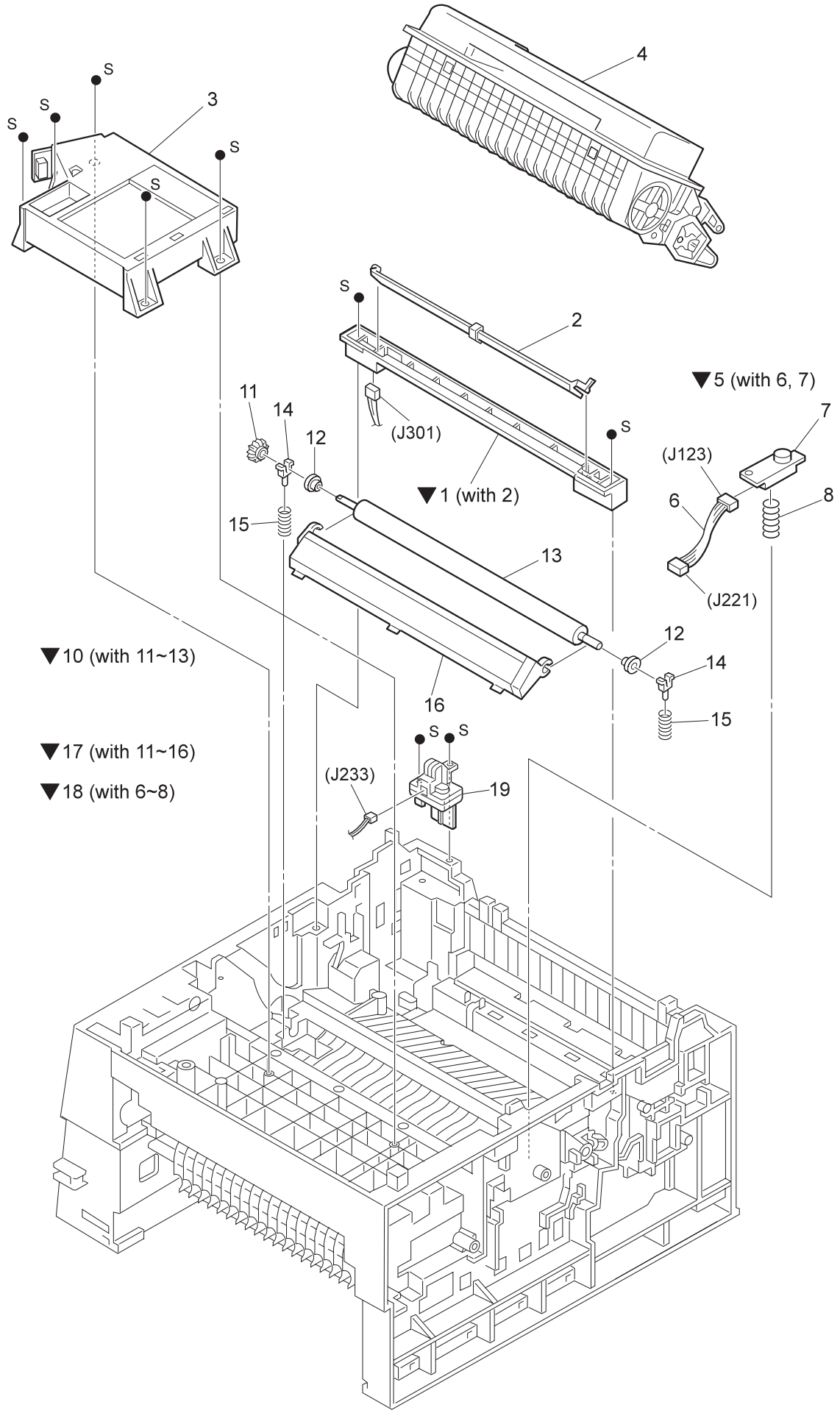
17
S
S
25

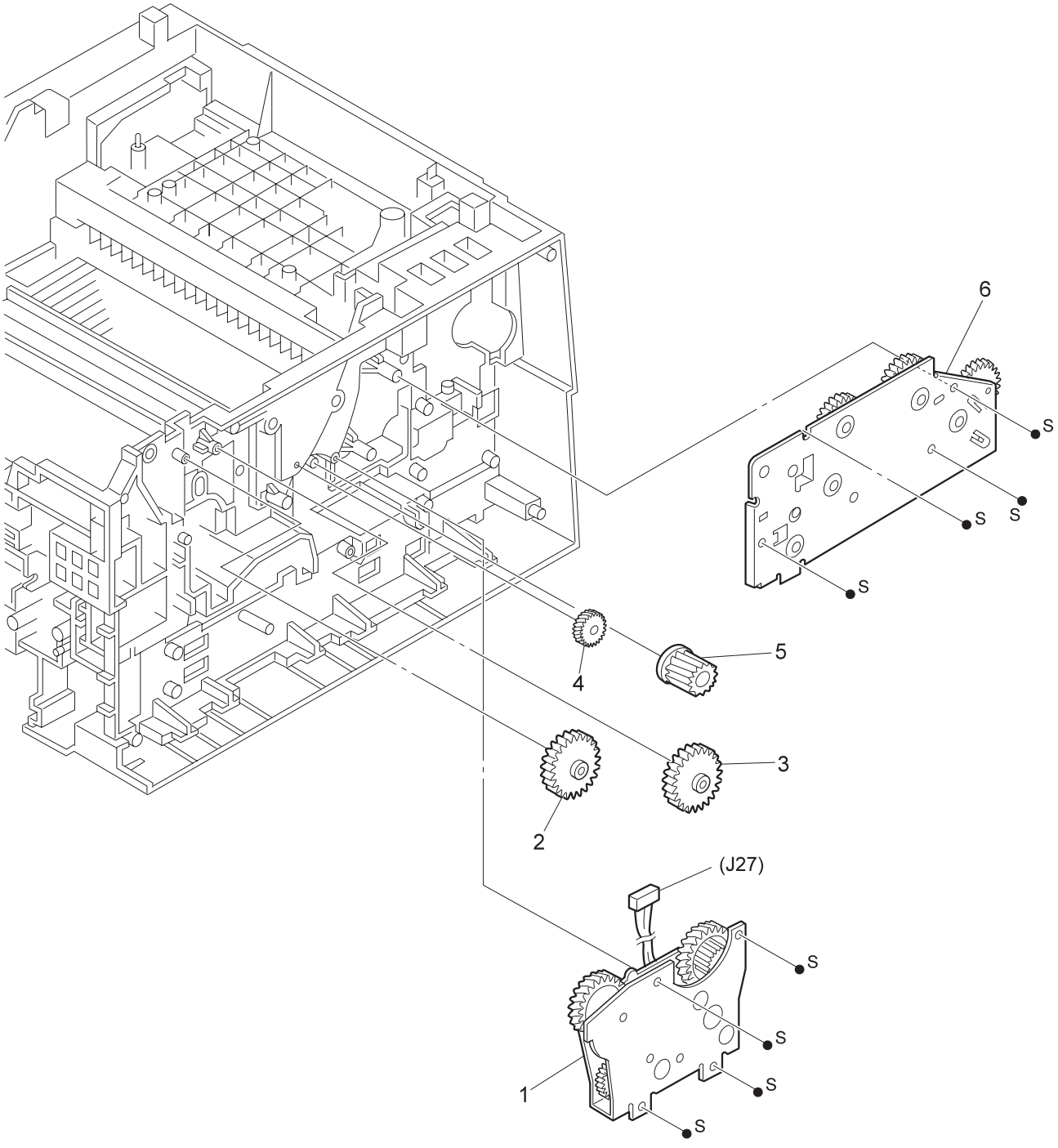
XEROGRAPHIC MODULE

1. Mirror Assembly (with 2) $
2. Shutter Mirror
3. ROS Assembly $
4. Cartridge Assembly EP. (CRU)
5. Sensor Assembly Toner (OPTION) (with 6~7)
6. Harness Assembly Toner Sensor (OPTION)
7. Sensor Toner (OPTION)
8. Spring Toner Sensor (OPTION)
9. - -
10. Roll Assembly BTR (with 11~13)
11. Gear BTR
12. Roll Tracking BTR
13. Roll BTR
14. Bearing BTR
15. Spring BTR
16. Chute Assembly BTR
17. Kit Roll Assembly BTR 2 (with 11~16) $
18. Kit Toner Sensor (with 6~8) $
19. Switch Assembly 5V Interlock $


4
S
S
S
S
3
S
2
S
(J301)
▼1 (with 2)
11
14
12
15
▼5 (with 6, 7)
7
(J123)
6
8
(J221)
13
12
14
15
16
▼10 (with 11~13)
▼17 (with 11~16)
▼18 (with 6~8)
S
S
(J233)
19

DRIVE MODULE

1. Drive Assembly Main $
2. Gear 11
3. Gear 10
4. Gear 13
5. Gear 12
6. Drive Assembly-F/P $


6
S
S
S
S
5
4
3
2
(J27)
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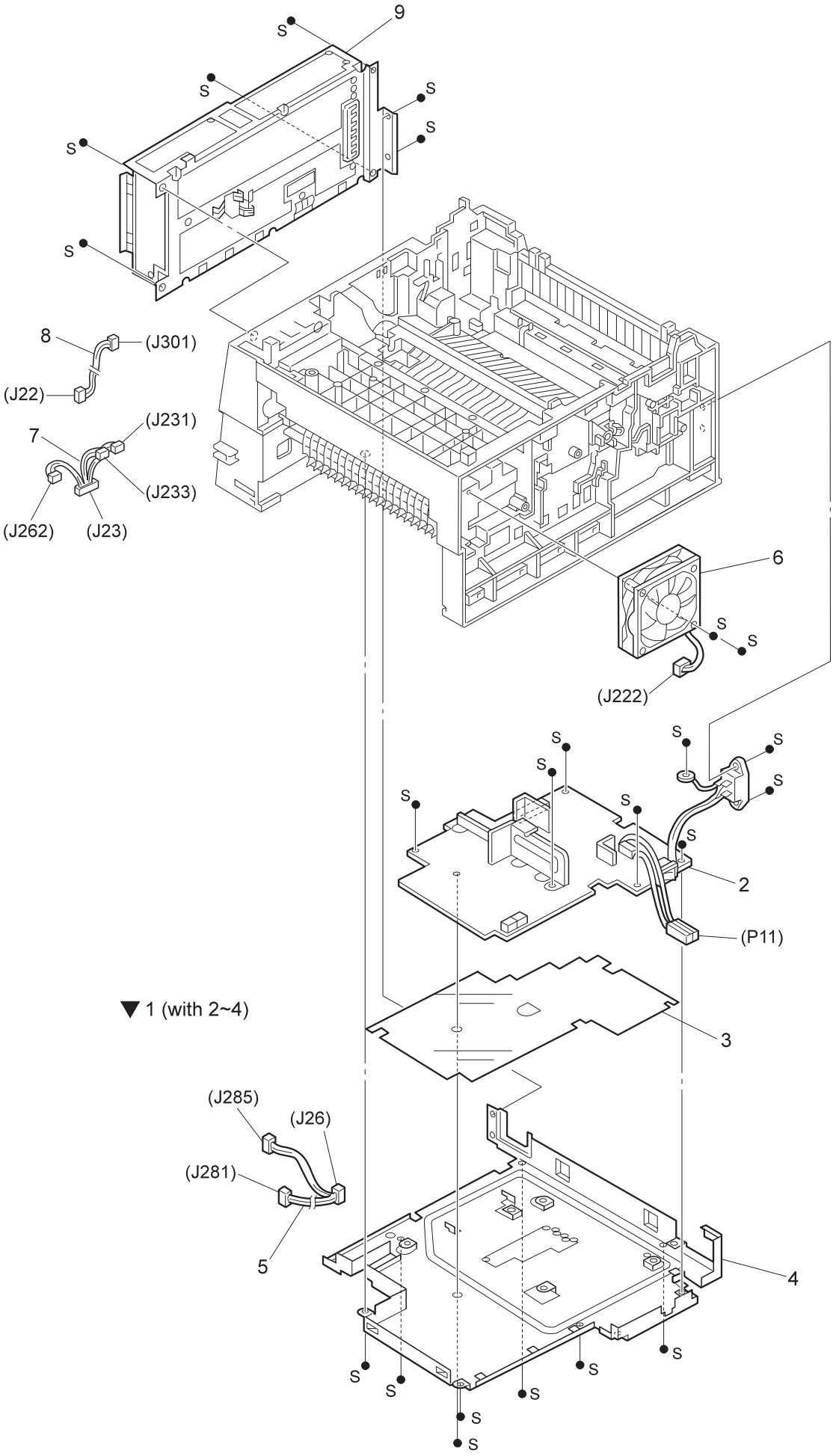
S
S
S
1

ELECTRICAL MODULE

1. Chassis Assembly PS (with 2~4)
2. HPS $
3. Sheet PS
4. Chassis PS
5. Harness Exit-HE $
6. Fan IOT $
7. Harness Assembly ROS-HE
8. Harness Assembly SOS-HE
9. Shield Assembly Bottom (E)
10. ---


9
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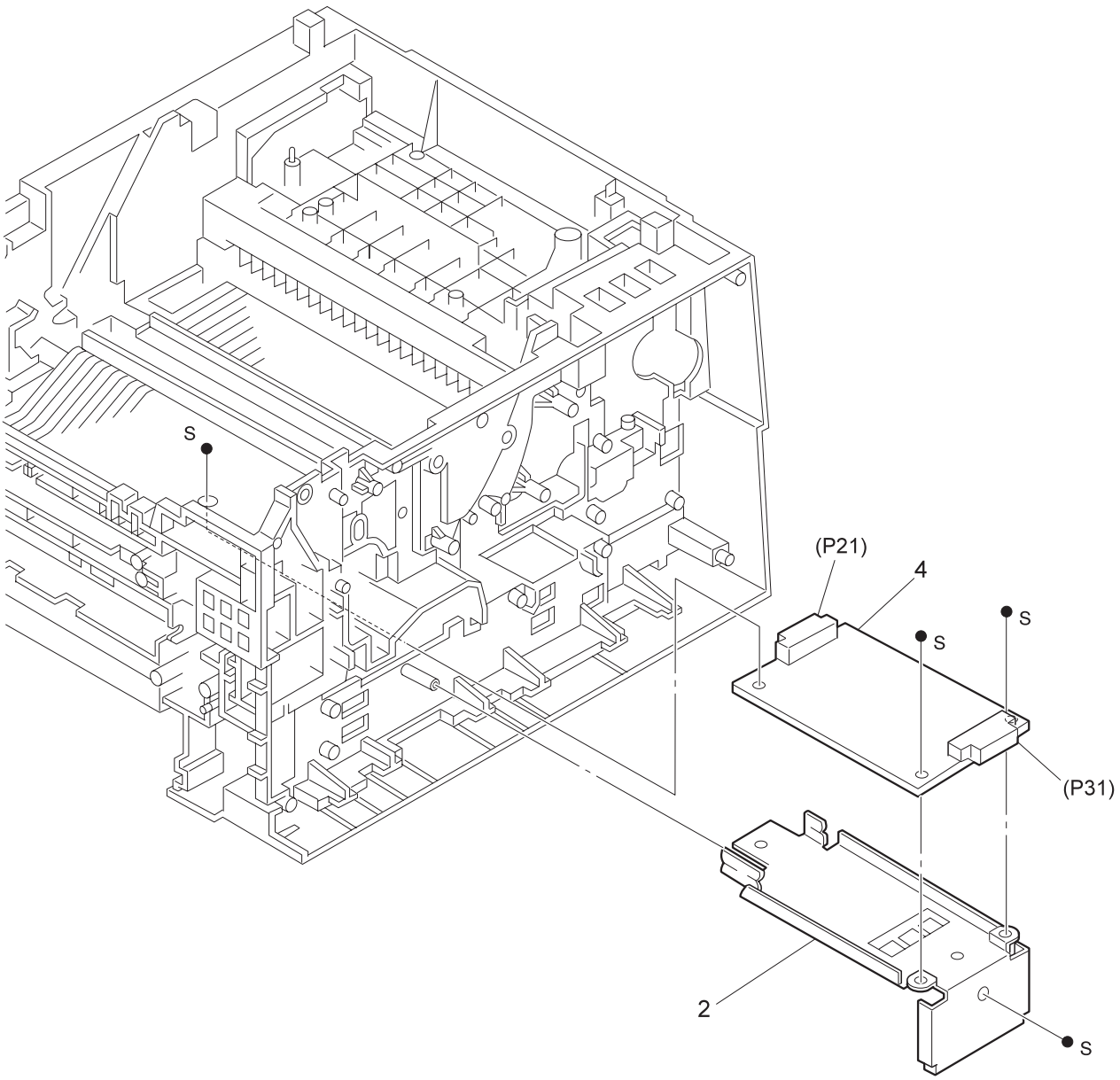
8
(J301)
(J22)
7
(J231)
(J233)
(J262)
(J23)
6
(J222)
2
(P11)
▼ 1 (with 2~4)
3
(J285)
(J26)
(J281)
5
4

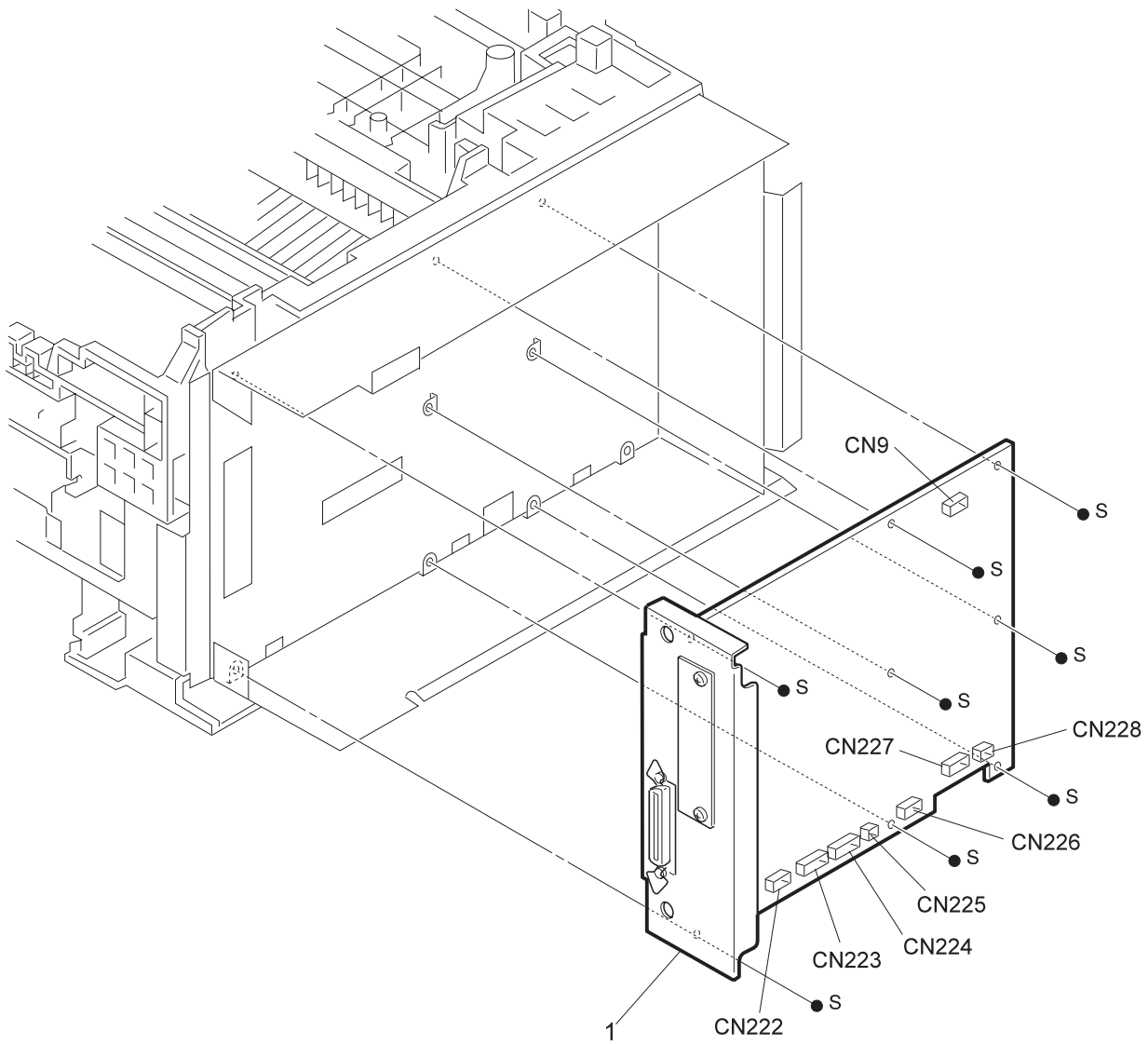
MCU

1. --
2. Holder Electrical
3. --
4. PWBA Hotaru $


S
(P21)
4
S
S
(P31)
2
S

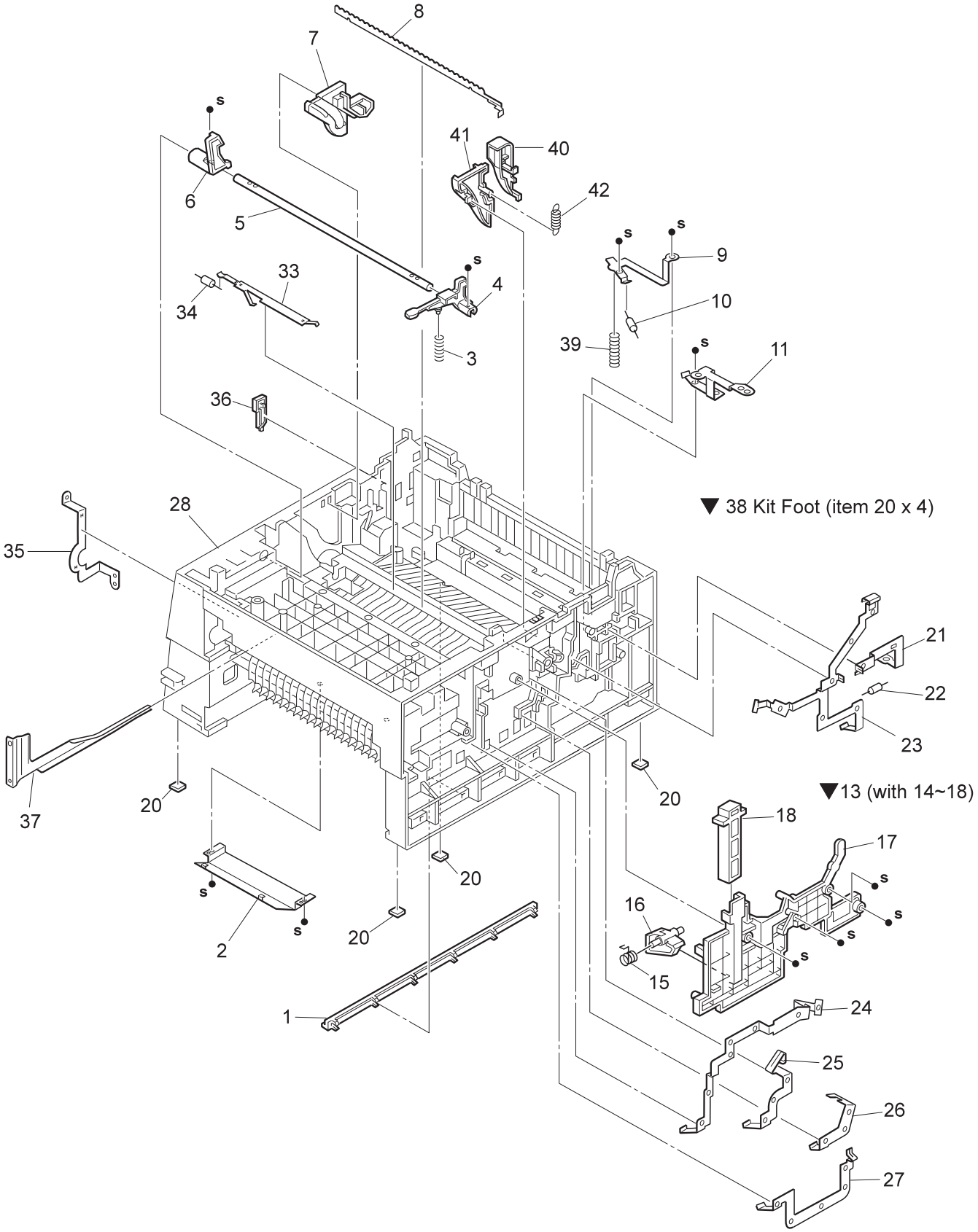
CONTROLLER

1. Controller Assembly (C258MAIN BOARD)


CN9
S
S
S
S
S
CN228
CN227
S
CN226
S
CN225
CN224
CN223
S
1
CN222

FRAME

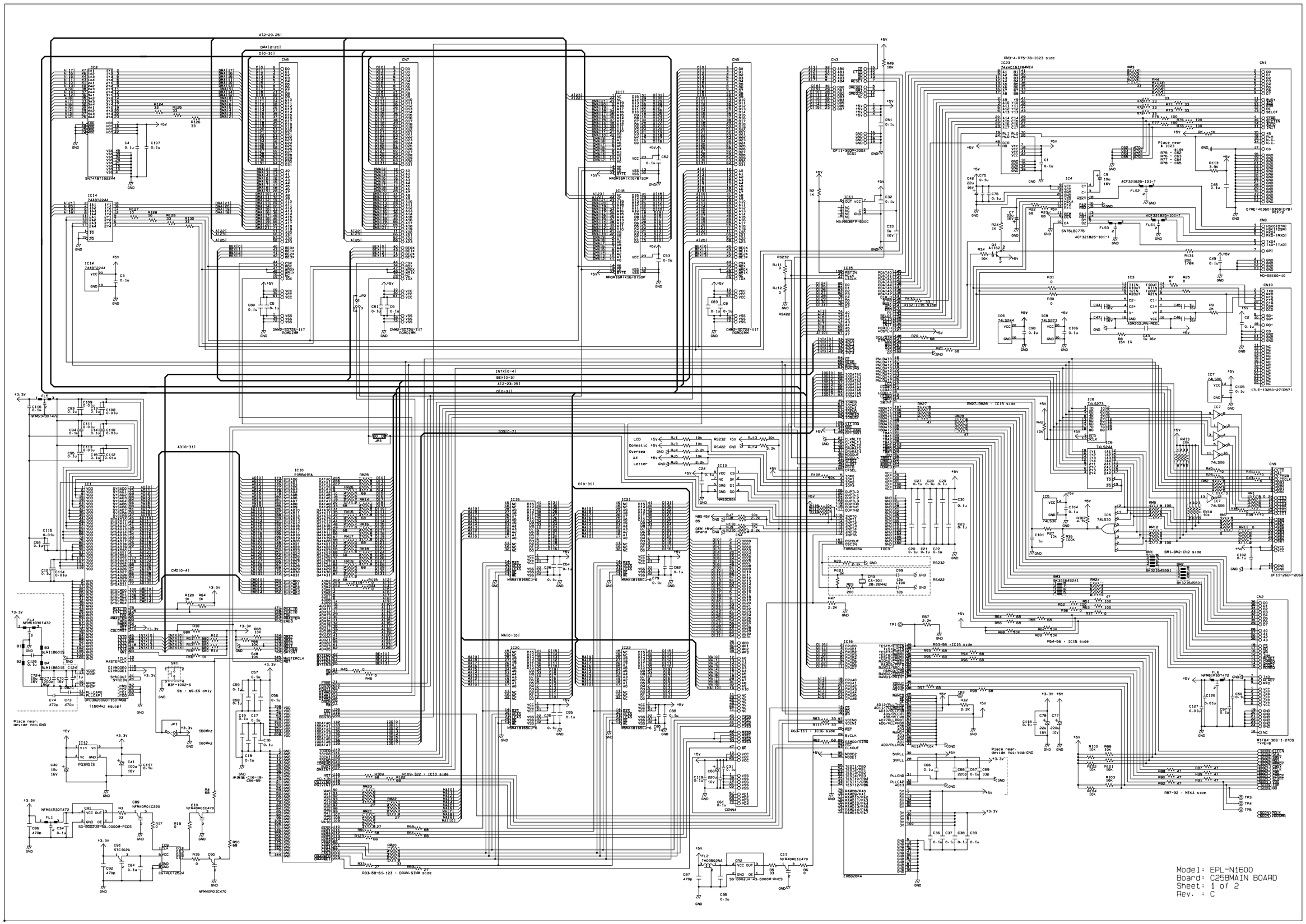
1. Guide CST R
2. Plate Frame Upper
3. Spring Latch
4. Latch R
5. Shaft Latch
6. Latch L
7. Guide L
8. Eliminator
9. Plate-Ground
10. Diode
11. Spring Pressure Roll
12. --
13. Actuator Assembly ILS (with 14~18)
14. --
15. Spring Cam
16. Cam Actuator
17. Guide Actuator
18. Actuator Interlock Switch
19. --
20. Foot
21. Plate-Heat Roll
22. Diode
23. Plate Contact RTN
24. Plate Contact CR
25. Plate Contact BTR
26. Plate Contact DB
27. Plate Contact DTS
28. Frame Main
29. --
30. --
31. --
32. --
33. Plate Contact FG
34. Resistor Baffle
35. Plate Earth MBF,Main
36. Guide Link
37. Chute Side Registration
38. Kit Foot (item 20 x 4) $
39. Spring-Ground
40. Guide R (A)
41. Guide R (B)
42. Spring

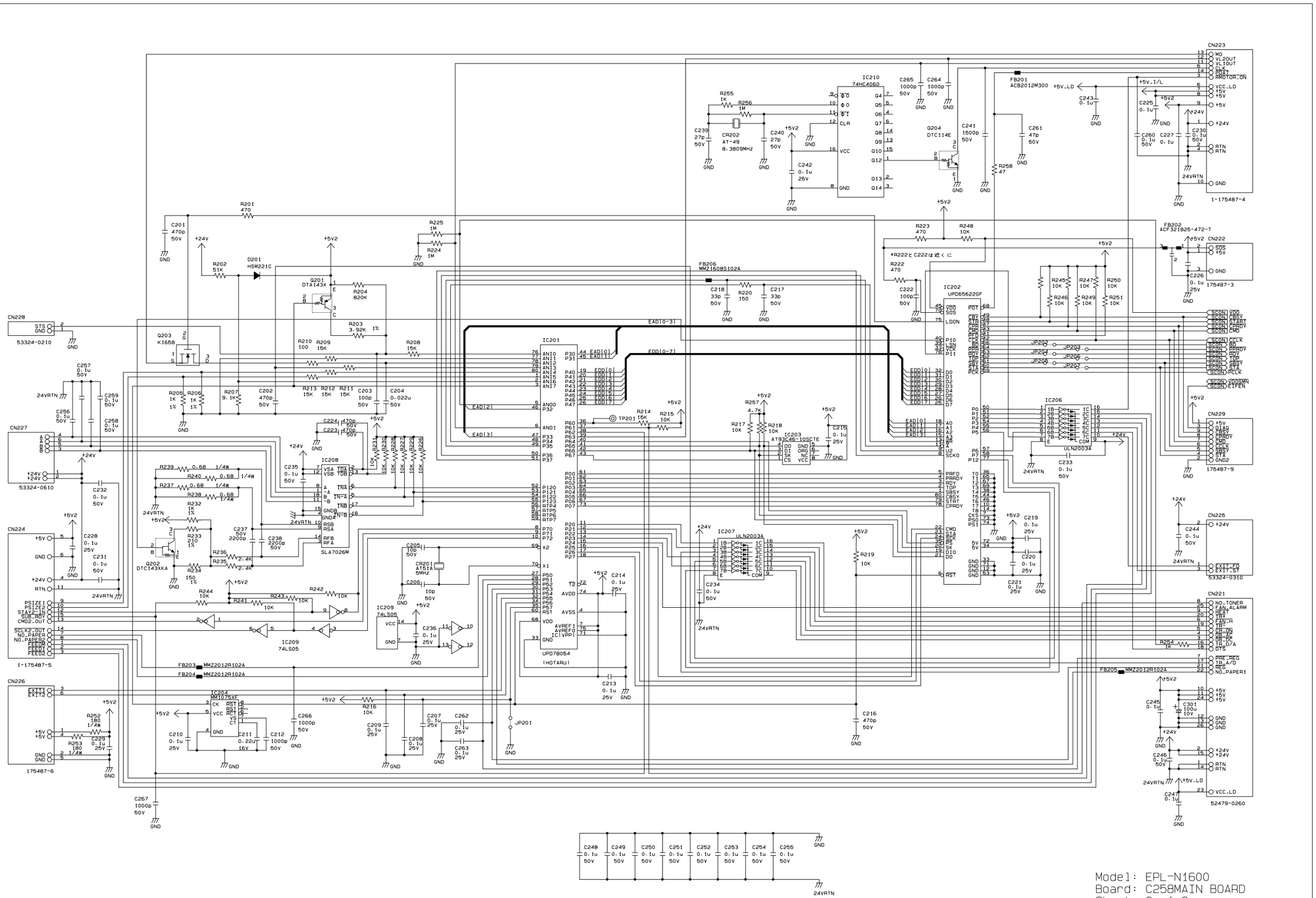

8
7
s
41
40
6
42
5
s
s
9
s
33
4
10
34
39
3
s
11
36
▼ 38 Kit Foot (item 20 x 4)
28
35
21
22
23
37
20
20
▼13 (with 14~18)
18
17
s
s
s
16
s
s
20
20
15
2
1
24
25
26
27

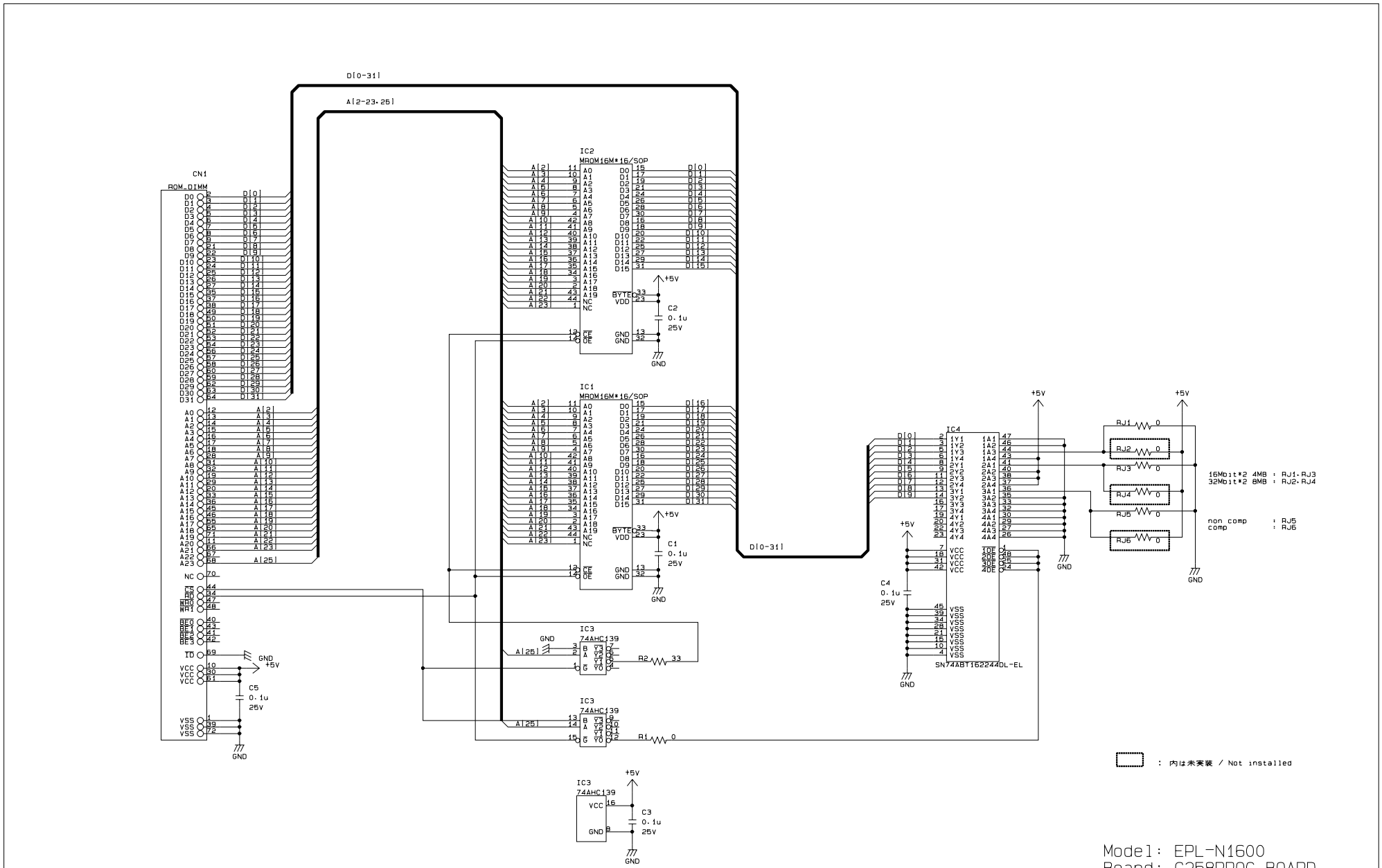
7.3 Circuit Schematics

The circuit schematics of circuit boards listed below are shown in following pages.

- C258MAIN BOARD (Main controller)
- C258PROG BOARD (ROM-DIMM Board)


Model: EPL-N1600
Board: C258MAIN BOARD
Sheet: 1 of 2
Rev. : C


CN223
IC210 74HC4060
CR202 AT-49 8.3809MHz
Q204 DTC114E
FB201 ACB2012M300
CN222
FB202 ACF321825-472-T
IC202 UPD65622GF
*R222とC222は欠く に
FB206 MMZ1608S102A
IC201
CN228 STS GND 53324-0210
Q201 DTA143X
Q203 K1658
D201 HSM221C
CN227
CN224
CN226
IC208 SLA7026M
Q202 DTC143XKA
IC209 74LS05
IC204 WM1075XE
IC207 ULN2003A
IC206 ULN2003A
IC203 AT93C46-10SCTE
UPD78054 (HOTARU)
CN229
CN225
CN221
FB203 MMZ2012R102A
FB204 MMZ2012R102A
FB205 MMZ2012R102A
JP201
JP202
JP203
JP204
JP205
JP206
JP207
TP201
EAD[0-3]
EDD[0-7]
+5V_I/L
+5V_LD
VCC_LD
24VRTN
1-175487-4
175487-3
175487-9
1-175487-5
175487-6
53324-0210
53324-0610
53324-0310
52479-0260
Model: EPL-N1600
Board: C258MAIN BOARD
Sheet: 2 of 2
Rev. : C


D[0-31]
A[2-23,25]
CN1
ROM_DIMM
IC2
MROM16M*16/SOP
IC1
MROM16M*16/SOP
IC3
74AHC139
IC4
SN74ABT162244DL-EL
C1
0.1u
25V
C2
0.1u
25V
C3
0.1u
25V
C4
0.1u
25V
C5
0.1u
25V
R1
0
R2
33
RJ1
0
RJ2
0
RJ3
0
RJ4
0
RJ5
0
RJ6
0
+5V
GND
16Mbit*2 4MB : RJ1･RJ3
32Mbit*2 8MB : RJ2･RJ4
non comp : RJ5
comp : RJ6
: 内は未実装 / Not installed
Model: EPL-N1600
Board: C258PROG BOARD
Sheet: 1 of 1
Rev. : 0

SERVICE MANUAL

EPSON EPL-N1600 Option

Duplex Unit

COLOR IMAGING EPSON

EPSON®

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE

1. EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the Duplex Unit for the EPL-N1600. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS
Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Revision Status

Revision	Issued Date	Description
Rev. 0	August 17, 1998	Preliminary release. (intended for service training purpose only)
Rev.A	October 30, 1998	First release.

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CHAPTER

1

PRODUCT DESCRIPTIONS

1.1 OVERVIEW

This section describes the specification of the 500 Sheets feeder.

BASIC SPECIFICATION

Paper Handling:	Tray reverse
Drive Source:	Driven by the base printer
Speed:	A4 = 7.8PPM / Letter = 8.0PPM
Capacity:	1 sheet (in reverse tray)
Paper Feed Origin:	Left edge of sheet

PAPER SPECIFICATION

Paper Type:
<Standard Paper>
Xerox 4024DP 20 lb. (75g/m^2) paper
<Normal Paper>
60 - 105 g/m^2 (16 - 28 lbs.)
- PPC Paper
- Bond paper
- Recycled paper

Paper Size:
A4 (210 x 297mm)
Letter (8.5 x 11 inch)
G-Legal (8.5 x 13 inch)
Legal (8.5 x 14 inch)

RELIABILITY/DURABILITY/SERVICEABILITY

MPBF:	25,000 sheets or more
MTBF:	3,000 hours or more
Life:	300,000 sheets or 5 years (whichever comes first)

Paper Feed Reliability *1:
<Jam rate>
1/2000 sheets or less
<Misfeed>
1/2000 sheets or less
<Multiple sheet feed>
1/500 sheets or less
<Folded coners>
1C or more at 1/1000 sheets or less
(1C or less is not included)

NOTE:

**1:With recommended paper and normal conditions*

MTTR: 30 minutes or less

DIMENSION AND WEIGHT

Dimension:	396 x 517 x 254 mm (W x D x H)
Weight:	6.5 Kg

CHAPTER

2

OPERATING PRINCIPLES

2.1 OVERVIEW

This section describes the operating principles of the Duplex Unit.

2.1.1 Paper Transportation

Paper is transported through the printer Base Engine and the Duplex Unit along the paper path shown in the Figure below when the Duplex Mode is selected or the optional Face UP Catch Tray is installed and selected. In the Duplex Mode, a sheet of paper printed on one side is guided into the Duplex Unit to re-feed, turned over in the Duplex Unit, reversed, and fed again into the Base Engine. When the optional Offset Catch Tray is selected, a sheet printed on one side in the Simplex Mode or a sheet printed on both sides is delivered into the Face Up Catch Tray through the Duplex Unit.

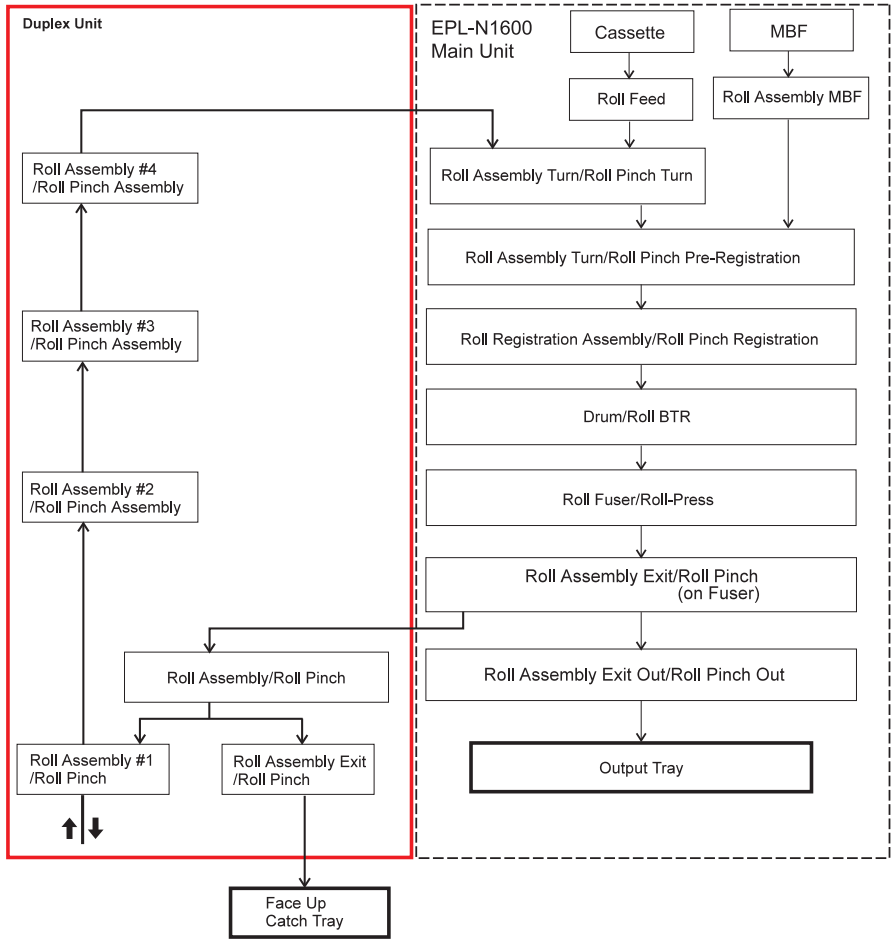


Figure 2-1. Paper Transport Path

The Figure below is a cut-section side view of the EPL-N1600 with the optional Duplex Unit attached that shows the paper path and the major components directly related to the paper transportation.

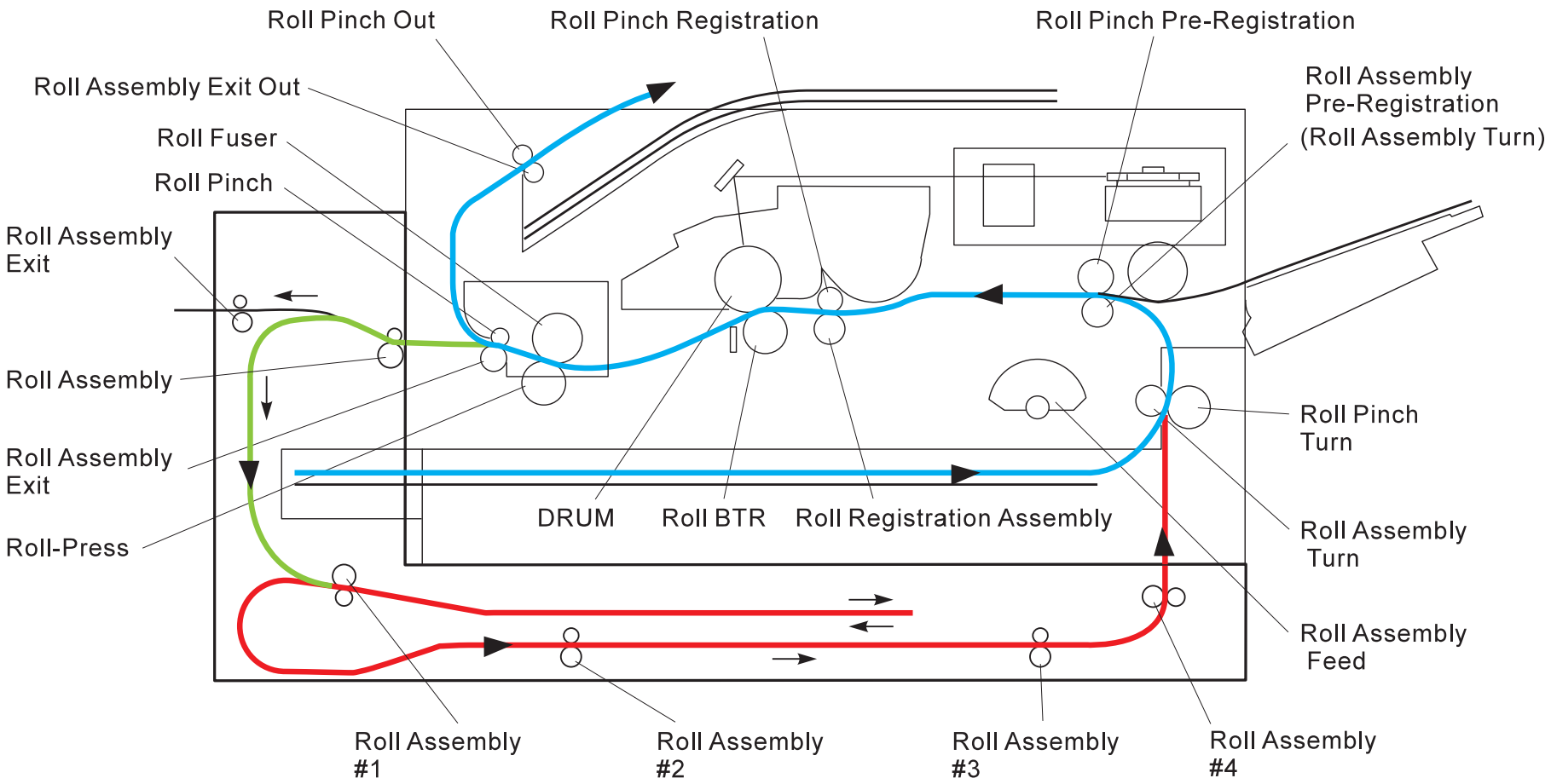


Figure 2-2. Duplex Printing Paper Path

PAPER TRANSPORTATION CONTROL

The figure below shows the paper movements in duplex printing mode.

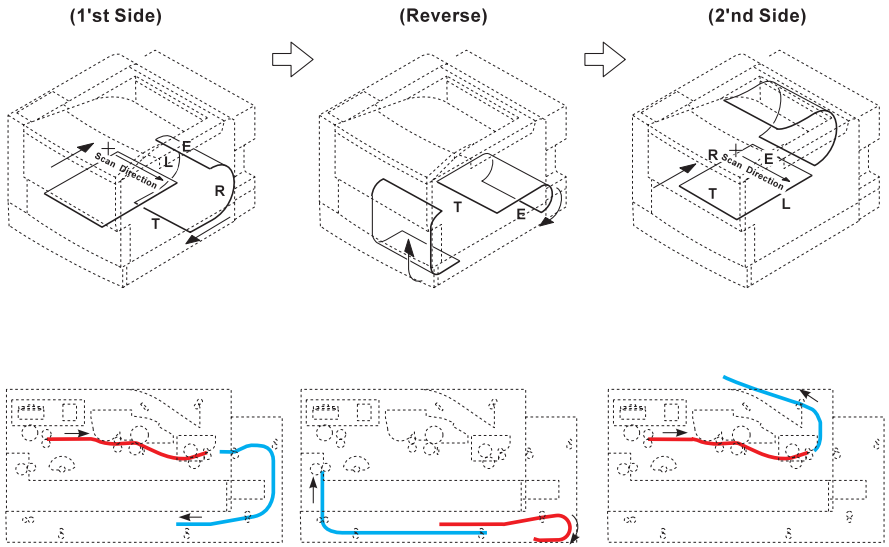


Figure 2-3. Paper Movement Control

SCANNING DIRECTION IN DUPLEX PRINTING

The figure below shows the relationship between the main and sub scanning direction and a side of the page printed in duplex printing. The controller sends the image data to the engine according to the printing order of pages, lines (raster lines) on each page and pixels on each line.

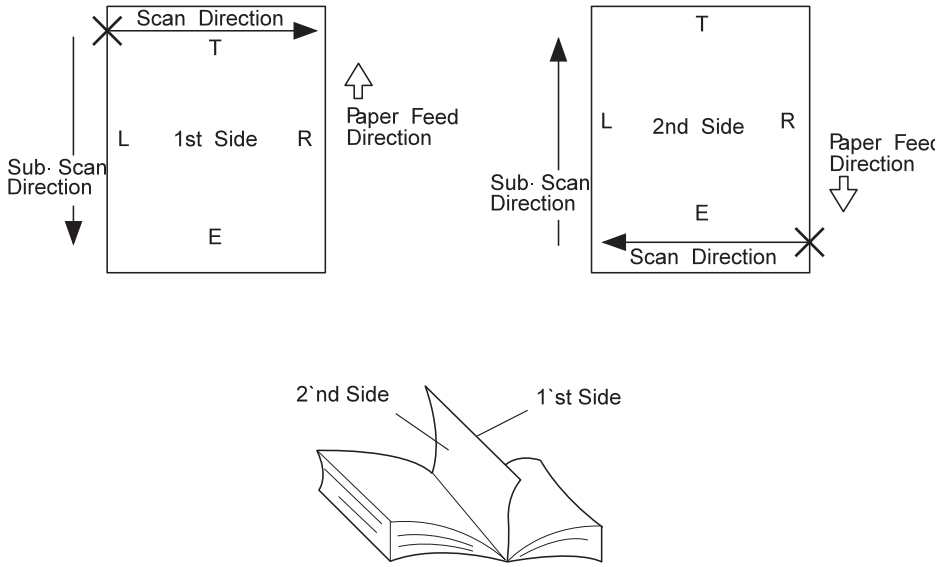


Figure 2-4. Scanning Direction

2.1.2 Drive Power Transmission

The Duplex Unit is operated by the drive power generated by the Main Motor and the Paper Handling Motor of the Base Engine and by the drive power generated by the Motor Duplex within the Duplex Unit. The figure in right shows the relations of each components.

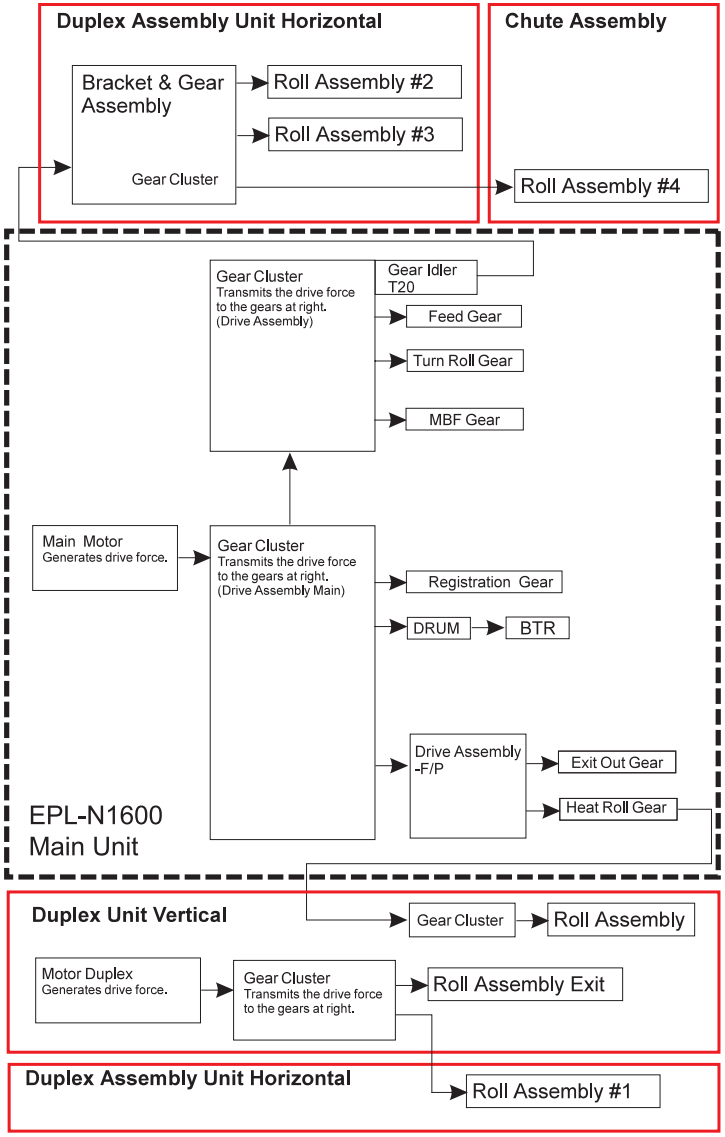
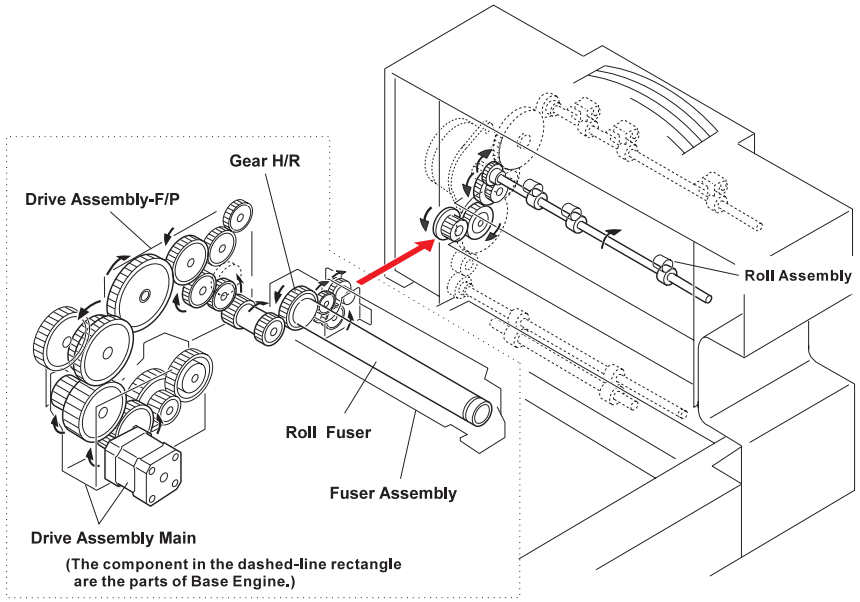
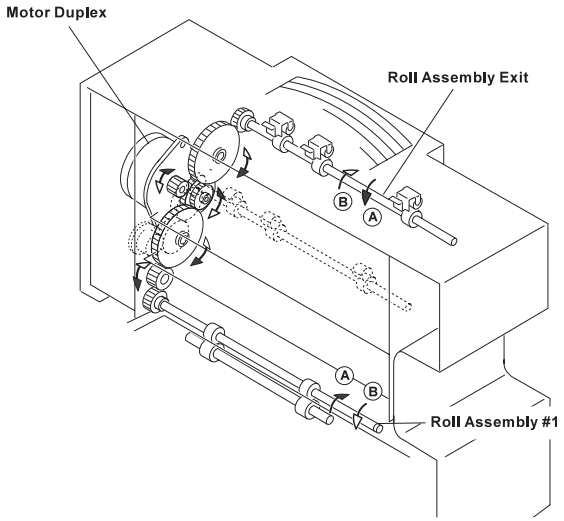


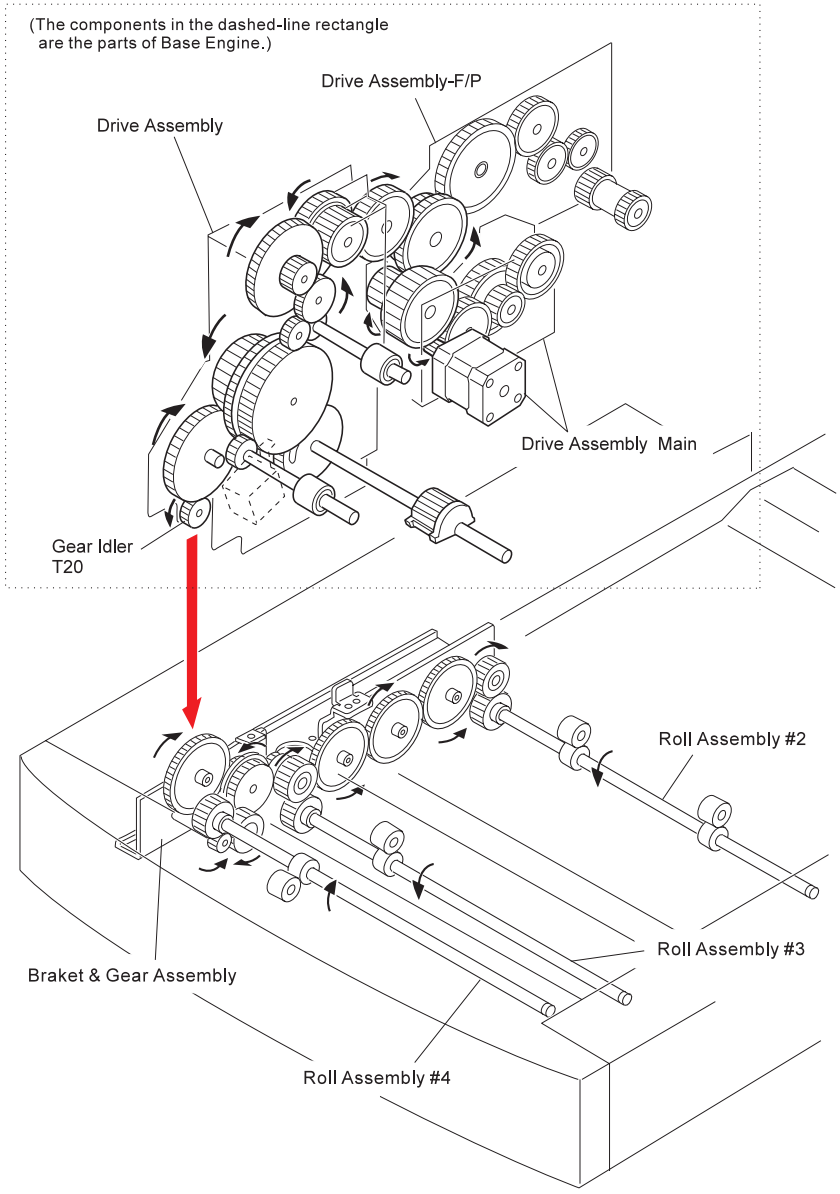
Figure 2-5. Drive Power Transmission

DUPLEX UNIT DRIVE POWER TRANSMISSION (1)





DUPLEX UNIT DRIVE POWER TRANSMISSION (2)



2.1.3 Function of Duplex Unit Major Components

VERTICAL UNIT

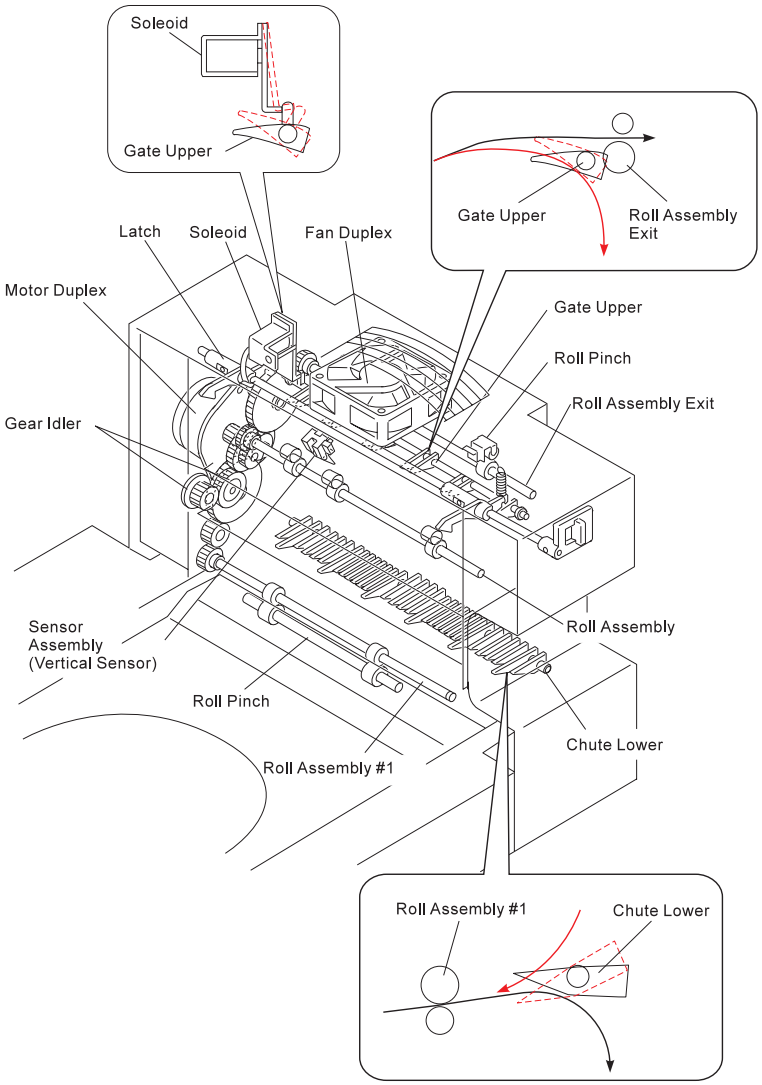


Figure 2-6. Duplex Unit - Vertical unit Components

Motor Duplex:	Generates the drive power for the Duplex Unit.
Gear Cluster:	Transmits the drive power from the Motor Duplex to the Roll Assembly Exit and to Roll Assembly #1 (part of the Horizontal Unit). When the Vertical Unit is in place, the Idler Gear in the Gear Cluster engages the gear on the end of the Roll Assembly #1 shaft, and transmits the drive power to Roll Assembly #1. When the Vertical Unit is tilted back, the Idler Gear disengage from the gear on the Roll Assembly #1 shaft.
Roll Assembly:	Works with Rolls Pinch to drive paper from the Fuser Exit Roll Assembly into the Vertical Unit. The drive power is transmitted from the Base Engine to the Roll Assembly, through the Duplex Gear Assembly of the Base Engine and the gears in the Duplex Unit.
Roll Assembly Exit:	Works with Rolls Pinch to drive paper out into the Face Up Catch Tray. The drive power for the Roll Assembly Exit is transmitted from the Motor Duplex through the Gear Cluster.
Gate Upper:	A moving baffle that switches the paper path to either Roll Assembly #1 or to the Roll Assembly Exit.
Solenoid:	Toggles the Gate Upper.

Sensor Assembly:	Sensor in the Vertical Unit which is located near the inlet and detects paper which enters the Duplex Unit. This sensor is also called the Vertical Sensor.
Chute Lower:	Pushed down by the paper coming from the Gate Upper, allowing the paper to proceed on to Roll Assembly #1. Without the weight of the paper pushing it down, the Gate returns to its raised position. Then the sheet of paper, driven in the reverse direction by Roll Assembly #1, is guided by the bottom side of the Gate Lower to Roll Assembly #2.
Fan Duplex:	Expels the air inside the Duplex Unit (and the printer through the rear exit of the printer) and introduces fresh air into the Duplex Unit and the printer) to prevent an excessive rise of the inside temperature.
Latch:	Secures the Vertical Unit to the rear of the Base Engine.

HORIZONTAL UNIT

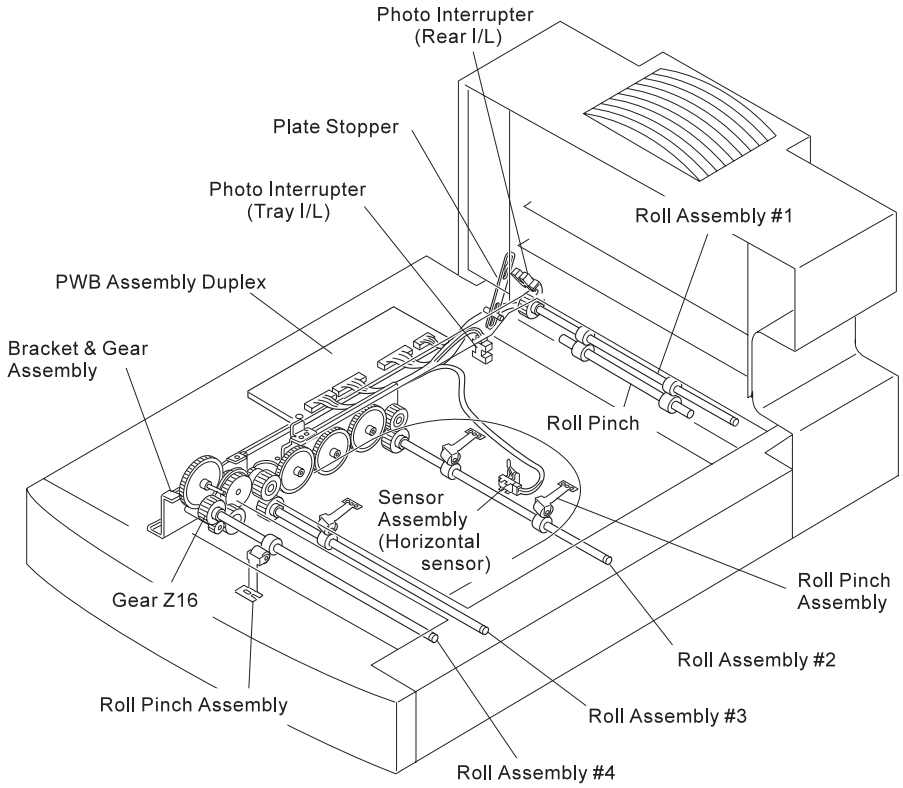


Figure 2-7. Duplex Unit - Horizontal Unit Components

Bracket & Gear Assembly: Receives the drive power from the Base Engine, and transmits it to Roll Assemblies #2, #3, and #4 of the Horizontal Unit.

Roll Assembly #: Receives the drive power from the Motor Duplex and Gear Cluster which are part of the Vertical Unit. Roll Assembly #1 rotates forward when receiving a sheet of paper with the first side printed. Roll Assembly #1 then rotates in reverse to drive the sheet to Roll Assembly #2 in preparation for printing the second side of the sheet.

Roll Assemblies#2/3/4: Drive the paper into and out of the Duplex Unit.

PWBA Assembly Duplex: Controls the Duplex Unit operation. The 4-bit MPU on the PWBA Duplex receives commands from the PWBA MMCU, receives signals from the Sensors within the Duplex Unit, actuates the Solenoid Duplex, and the Motor Duplex, and returns the status of the Duplex Unit.

Horizontal Sensor: Detects when a sheet of paper reaches Roll Assembly #2.

Duplex Unit ChuteCover Interlock: Photo interrupter (PL11.24) that monitors whether or not the Duplex Unit Chute Cover is in place.

Vertical Unit Interlock: Photo interrupter (PL11.24) that monitors whether or not the Vertical Unit is in position against the rear of the Base Engine.

Plate Stopper: Support and limiting arm for the Vertical Unit

Solenoid: Toggles the Gate Upper.

CHAPTER

3

TROUBLESHOOTING

This chapter is not appliacble to the Duplex Unit.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 OVERVIEW

This chapter explains how to disassemble the Duplex Unit and its various mechanisms. Except where otherwise indicated, the reassembly procedure is the reverse of the disassembly procedure.

4.1.1 Precautions

This section describes the precautions you must take to prevent accidents during disassembly and reassembly work. Be sure to carry out all work in accordance with the precautions and general instructions provided in this manual.

CAUTION

- **Be careful to avoid injury from frame edges and other sharp or protruding areas of the printer.**
- **Avoid touching IC elements with bare hands, so as to prevent possible damage from electrostatic discharge. If you need to touch these areas, wear appropriate electrostatic protection gear (electrostatic wrist band, etc.).**
- **To ensure work efficiency and safety, use only the tools specified in this manual.**
- **The unit uses screws of many different types. Be sure to note the correct location for each screw before removing it. Inserting screws into the wrong places may strip or damage the screw holes.**

4.1.2 Tools

The following table lists the tools you need to disassemble and reassemble the printer.

Table 4-1. Required Tools

Tool	Market Availability	Code
Phillips screwdriver	Yes	B743800200
Tweezers	Yes	B641000100
Round nose pliers	Yes	B740400100

4.2 DISASSEMBLY AND ASSEMBLY

This section describes the procedures for disassembling the Duplex Unit. The assembly of the unit can be made by performing the disassembly step in reverse order unless otherwise specified, and the assembly procedure is therefore omitted in this manual.

4.2.1 Duplex Unit Removal

1. Switch OFF printer power and remove the AC power cord from the rear of the printer.
2. Disconnect all interface cables from the rear of the printer.
3. Remove the 500 Sheet Feeder, if one is installed.
4. Push the Vertical Unit release lever to the rear (1) and tilt the Vertical Unit away from the printer (2).
5. Press the Feeder Joint Clips together and remove the two rear feeder joints securing the Duplex Unit to the Printer.
6. Remove the 250 Sheet Cassette and the Chute Assembly (4).
7. Press the feeder joint clips together and remove the two front feeder joints securing the Duplex Unit to the printer (5).
8. Lift the base engine off of the Duplex Unit.

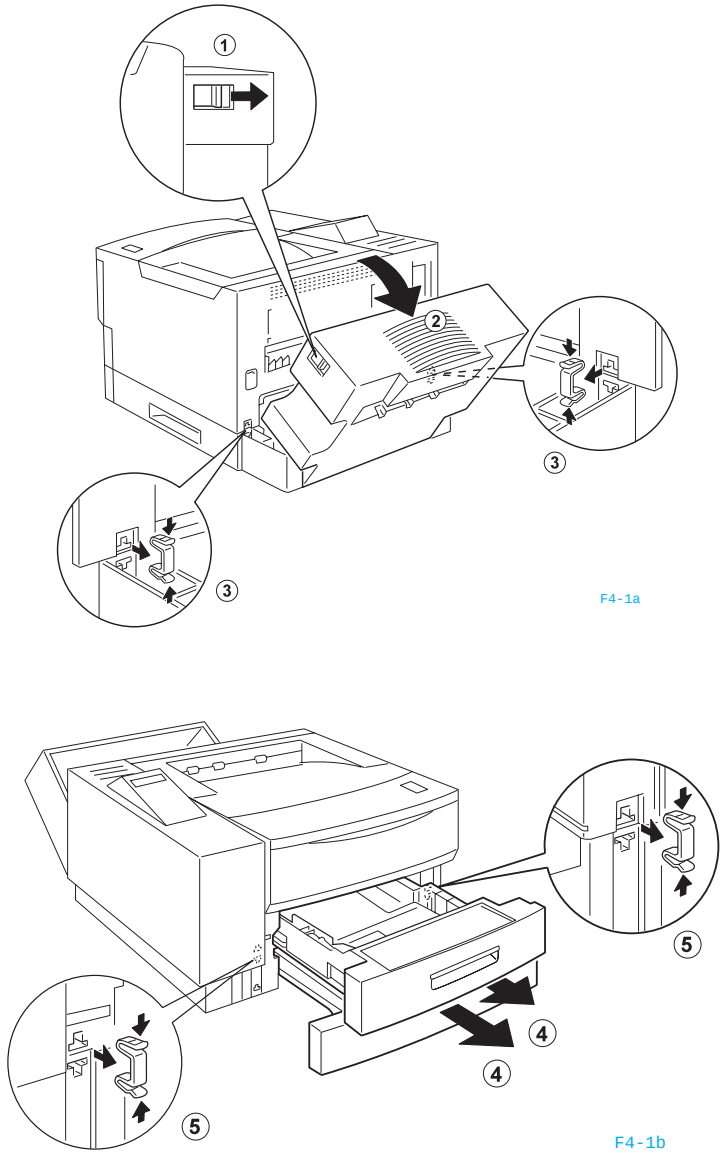
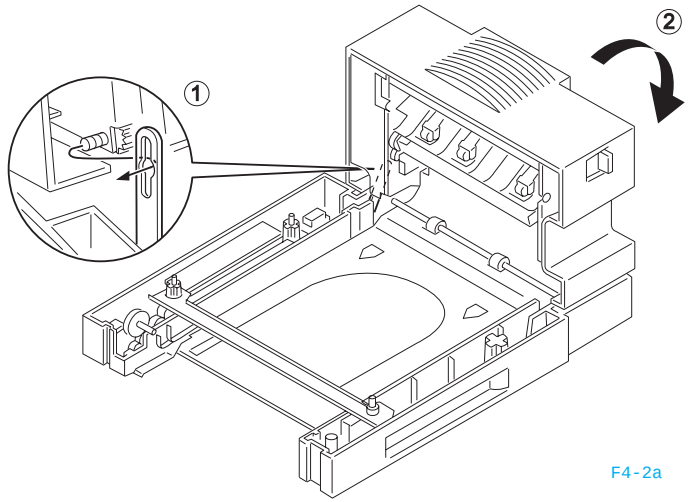


Figure 4-1. Duplex Unit Removal

4.2.2 Duplex Assembly Unit Vertical

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Slide the end of the Plate Stopper off of the post on the Frame L/H (1).
4. Tilt back the Vertical Unit (2).
5. Remove the wire clamp that holds the harness.
6. Remove the Bracket Sensor of the Rear Interlock Switch (PL11.1.9: Photo Interrupter) (4).
7. Disconnect J230 (5).
8. Remove the two screws that are securing the Plate Assembly Pivot and ground wire to the Frame L/H (6).
9. Pry off the Plate Assembly Pivot (7).
10. Slide the Duplex Assembly Unit Vertical to the left to free the right pivot from the Horizontal Unit, and remove the Vertical Unit.



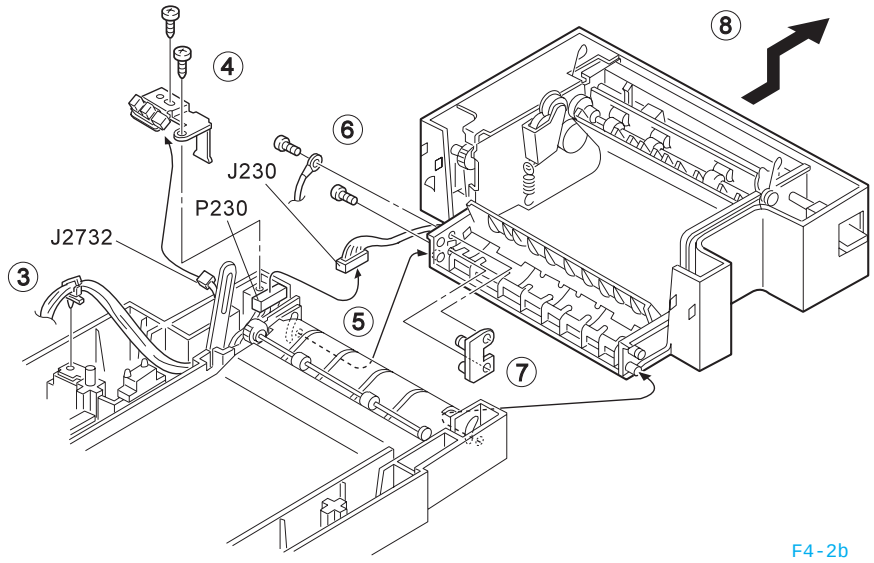


Figure 4-2. Duplex Assembly Unit Vertical Removal

4.2.3 Chute Cover

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the two screws that secure the Plate Cover to the Frame L/H, and remove the Plate Cover.
5. Remove the seven screws that are securing the Chute Cover to the Duplex Assembly Unit Vertical.
6. Lift the Duplex Assembly Unit Vertical out of the Chute Cover.

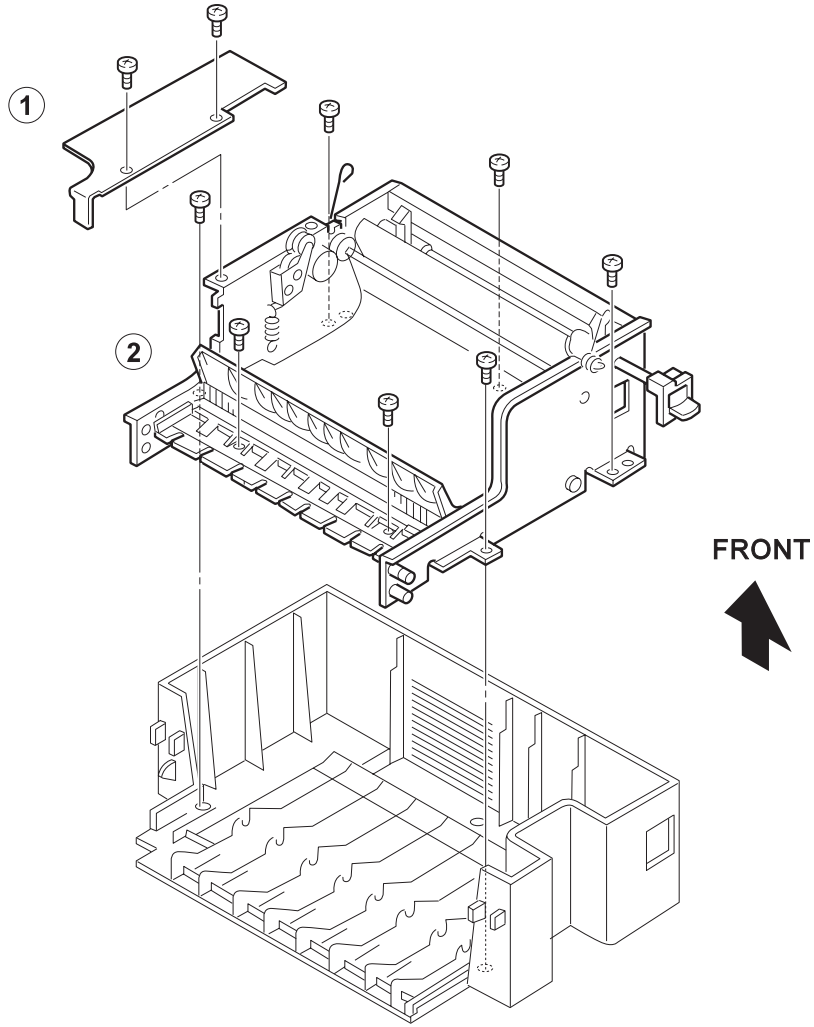


Figure 4-3. Chute Cover Removal

4.2.4 Fan Assembly Duplex

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Disconnect P249/J2491 and route the Harness Vertical out of the Frame.
6. Remove the two screws that secure the Fan Assembly Duplex to the Bracket Fan.
7. Remove the Fan.

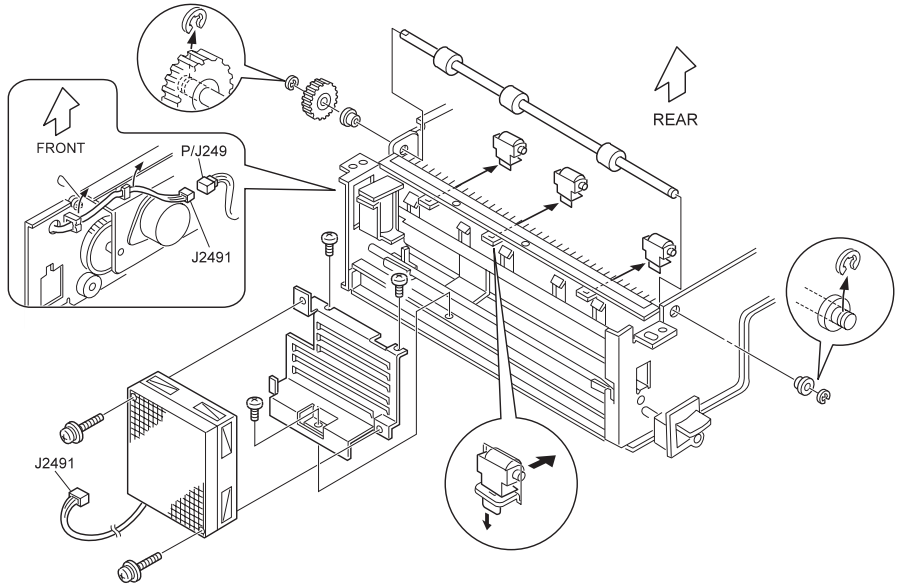


Figure 4-4. Fan Assembly Duplex Removal

4.2.5 Sensor Assembly (Vertical)

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Remove the Fan Assembly Duplex.
6. Disconnect J246 from the Sensor Assembly (Vertical).
7. Press in on the latching clips that are securing the Sensor to the Frame, and remove the Sensor.

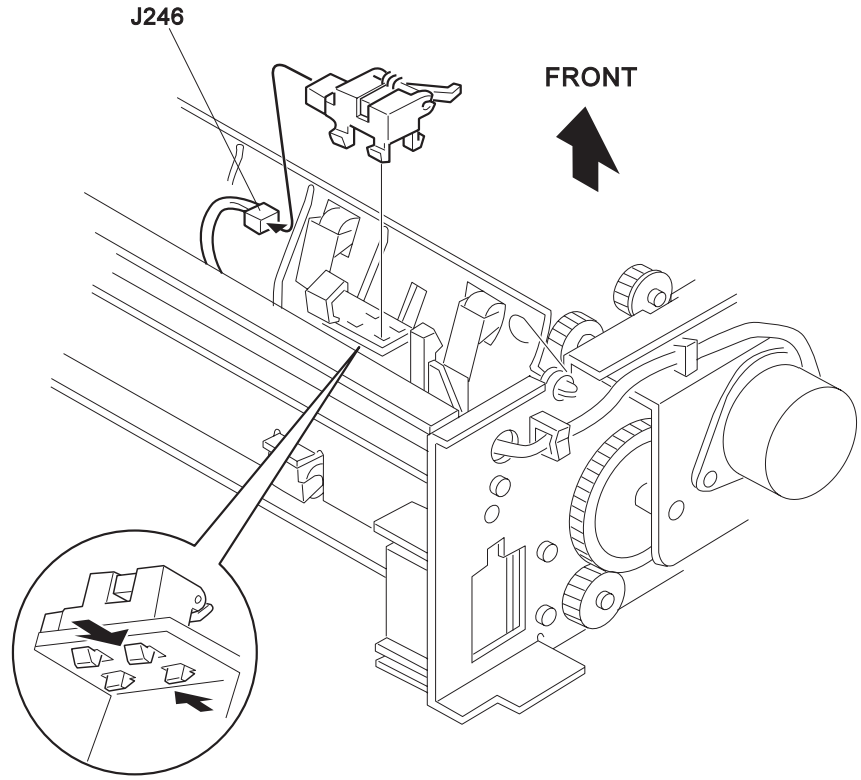


Figure 4-5. Sensor Assembly (Vertical) Removal

4.2.6 Motor Duplex

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Disconnect J244 from the Motor Duplex.
6. Remove the two screws that are securing the Motor Duplex to the Bracket, and remove the Motor.

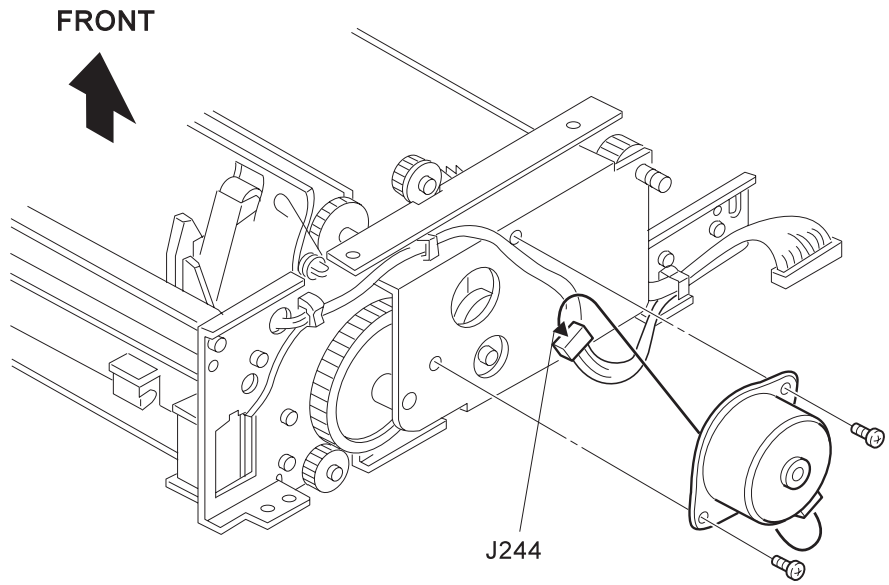


Figure 4-6. Motor Duplex Removal

4.2.7 Solenoid

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Disconnect J2471 (Solenoid) from P247.
6. Free the harness of the Solenoid from the wire clamp.
7. Turn the Chute Cover upside down.
8. Remove the screw that is securing the Solenoid to the Frame L/H.
9. Remove the Solenoid.

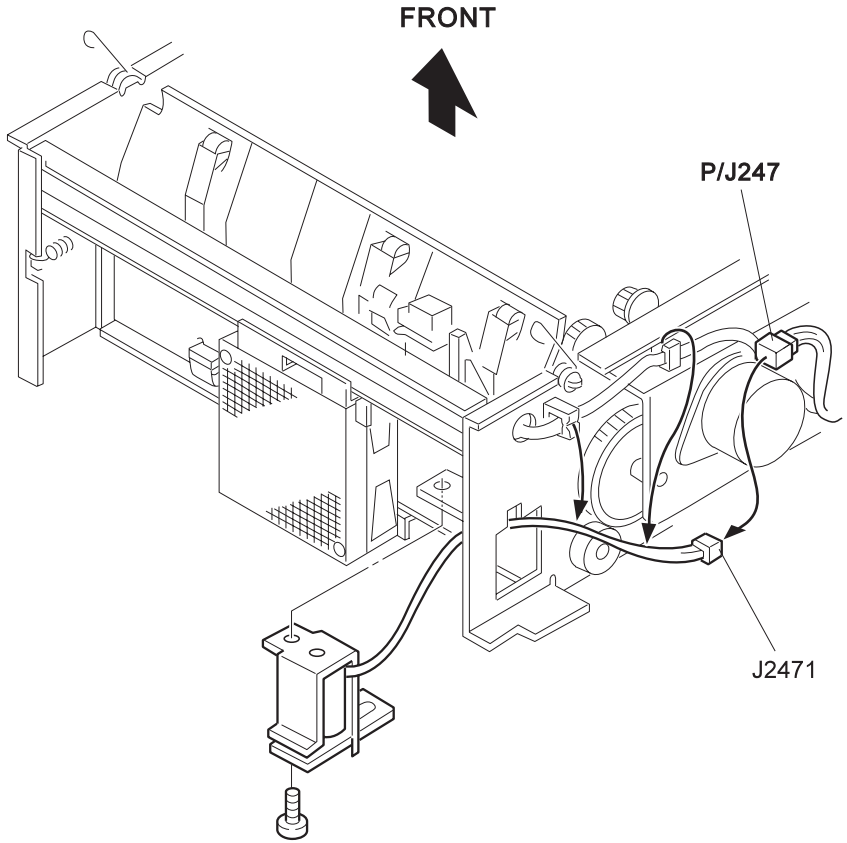


Figure 4-7. Solenoid Removal

4.2.8 Shaft Latch & Lever

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Remove the screw that is securing the left Latch to the Shaft Latch, and remove the Latch.
6. Remove the Spring that is attached to the right Latch.
7. Remove the screw that is securing the right Latch to the Shaft Latch, and remove the Latch.
8. Slide the Shaft Latch, along with the attached Lever, to the right and out of the Frame.

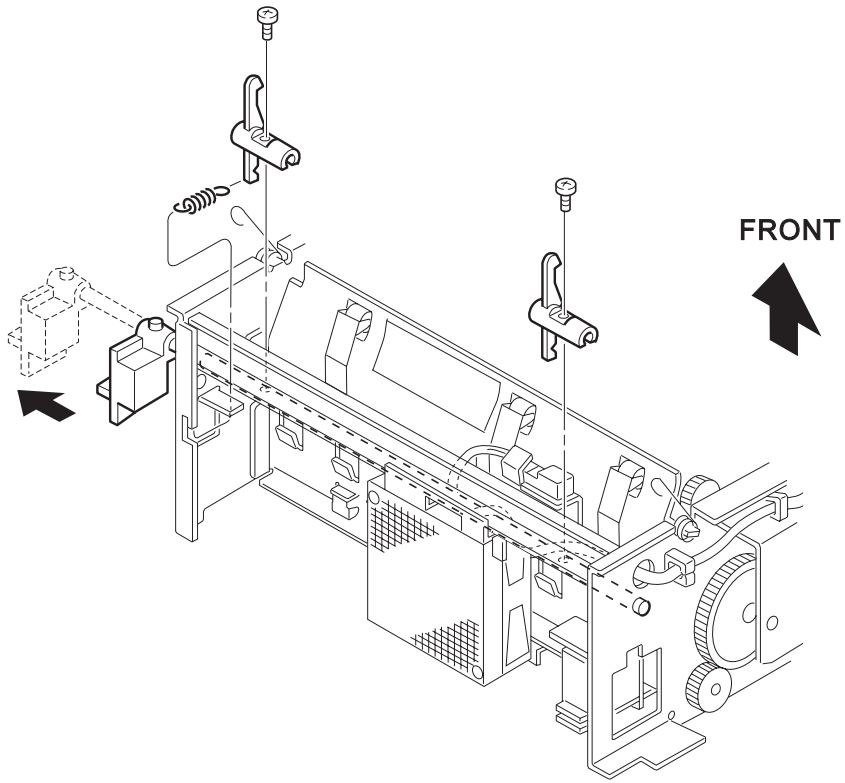


Figure 4-8. Shaft Latch/Lever Removal

4.2.9 Rolls Pinch & Roll Assembly Exit

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Remove the Fan Assembly Duplex.
6. Remove the three screws that secure the Bracket Fan to the Chute Upper 2 and Plate Tie.
7. Remove the E-rings from both ends of the shaft of the Roll Assembly Exit.
8. Remove the Bearing from the right end of the shaft.
9. Remove the Gear and Bearing from the left end of the shaft.
10. Slide the shaft to the left until the right end is freed from the Frame.
11. Slide the shaft to the right and out of the Frame.
12. Press down each Roll Pinch clip and remove the three Pinch Rolls from the Chute.

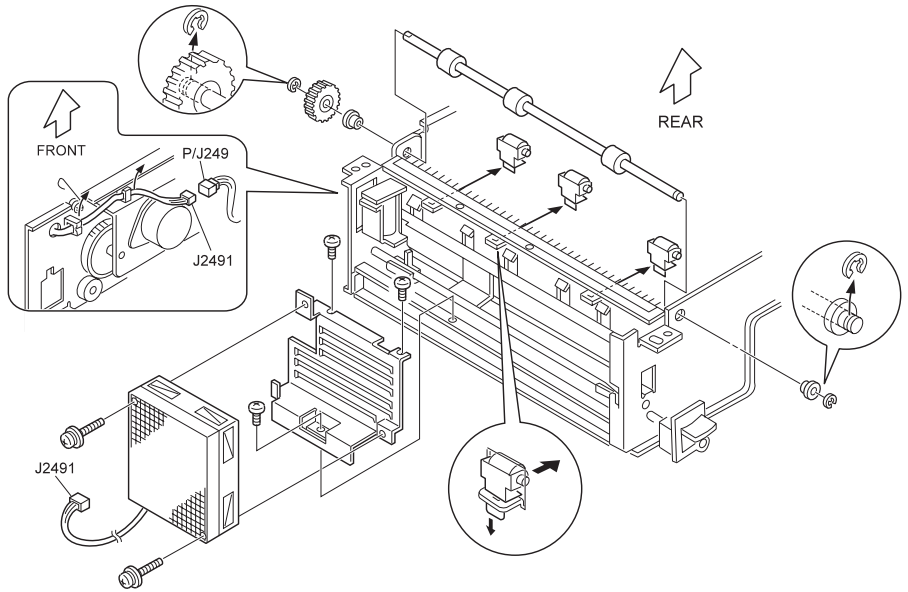


Figure 4-9. Rolls Pinch/Roll Assembly Exit Removal

4.2.10 Chute Lower & Roll Assembly

1. Remove the Duplex Unit.
2. Remove the Chute Upper.
3. Remove the Duplex Assembly Unit Vertical.
4. Remove the Chute Cover.
5. Remove the two screws that are securing the Chute Invert-V/TRA to the Frame R/H and Bracket Pivot R/H.
6. Pull the Frame R/H away from the Chute Invert-V/TRA so you can free the Chute Lower right pivot from the Frame R/H.
7. Slide the Chute Lower to the right and free the Chute Lower left pivot from the Frame L/H and remove the Chute Lower from the Frame.
8. Remove the E-rings from both ends of the shaft of the Roll Assembly.
9. Remove the Bearing from the right end of the shaft:
10. Remove the Gear and Bearing from the left end of the shaft.
11. Lift the Roll Assembly off of the Chute Lower.

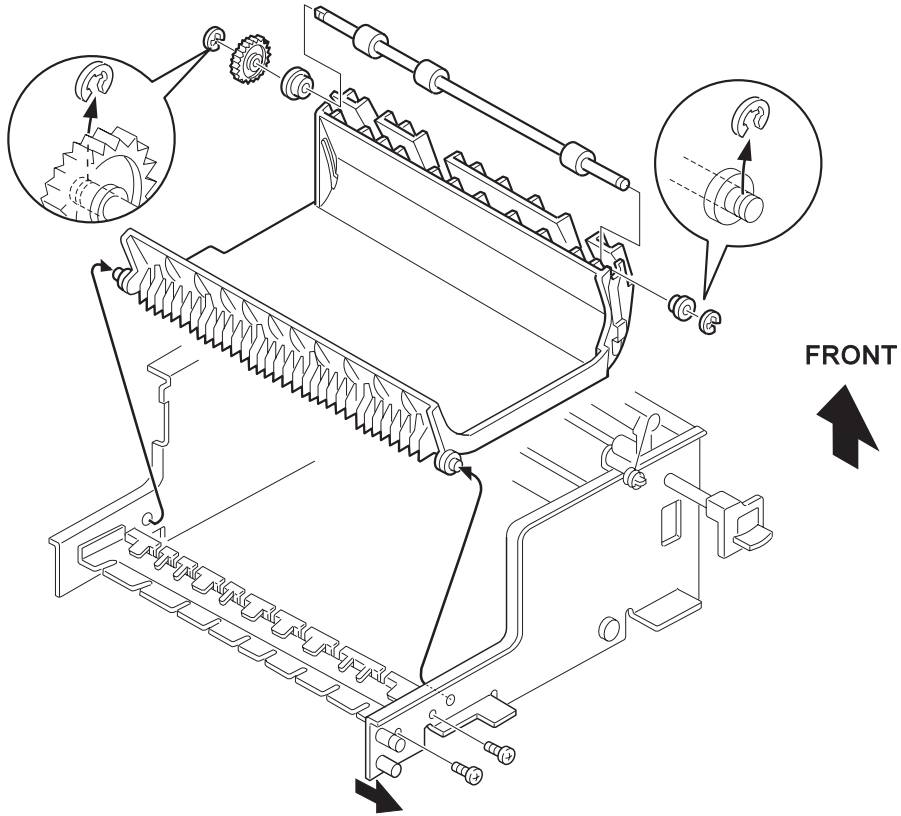


Figure 4-10. Chute Lower/Roll Assembly Removal

4.2.11 Photo Interrupters (Rear I/L & Chute Cover I/L)

1. Remove the Duplex Unit.
2. Slide the end of the Plate Stopper off of the post on the Frame L/H. See the illustration (1).
3. Tilt back the Duplex Assembly Unit Vertical.

PHOTO INTERRUPTER (PL11.1.9: REAR INTERLOCK)

4. Remove the two screws that is securing the Rear Interlock Bracket Sensor to the Frame.
5. Remove the Bracket, along with the attached Rear Interlock Switch.
6. Disconnect J2732 from the Rear Interlock Switch.
7. Press in on the locking clips and remove the Rear Interlock Switch from the Bracket.

PHOTO INTERRUPTER (PL11.2.15: CHUTE COVER INTERLOCK)

8. Remove the Chute Upper.
9. Slide the Chute Assembly out of Duplex Unit.
10. Press in on the locking clips and remove the Cute Cover Interlock Switch from the Support Duplex-L/H.
11. Disconnect J2733 from the Chute Cover Interlock Switch.

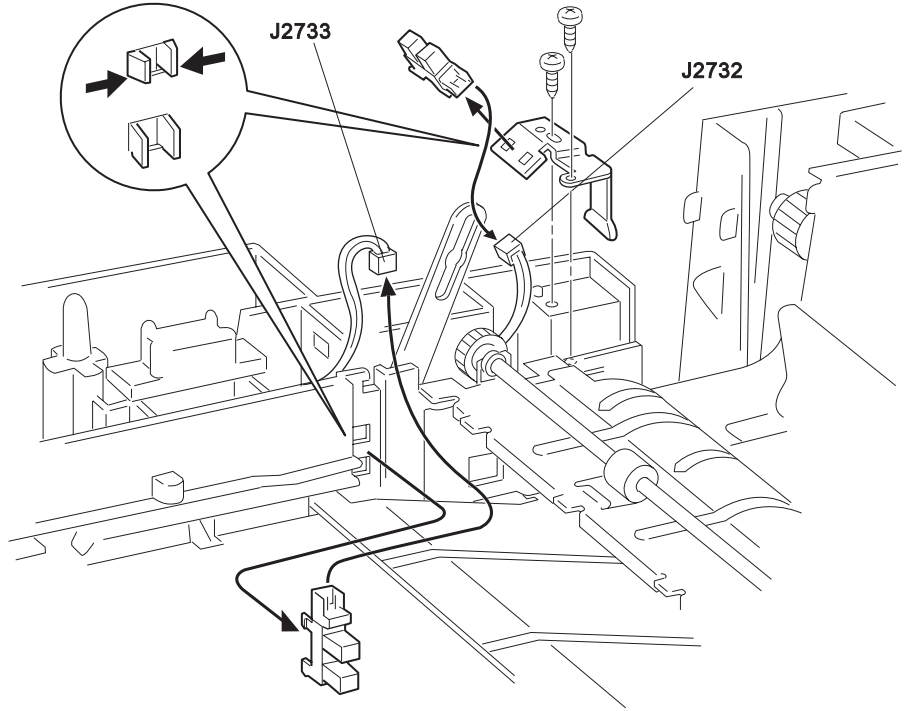


Figure 4-11. Photo Interrupter (Rear I/L, Chute Cover I/L) Removal

4.2.12 Chute Upper

1. Tilt back the Duplex Assembly Unit Vertical.
2. Remove the four screws that are securing the Chute Upper to the Horizontal Unit.
3. Remove the Chute Upper.

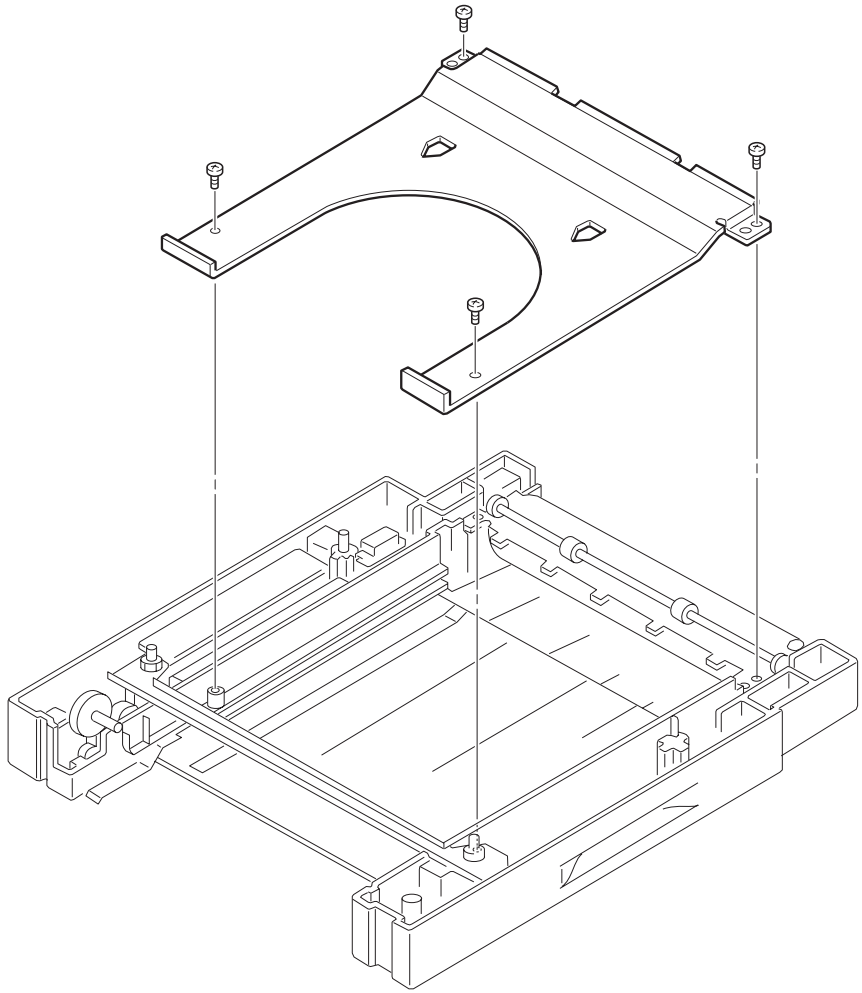


Figure 4-12. Chute Upper Removal

4.2.13 Sensor Assembly (Horizontal)

1. Remove the Duplex Unit.
2. Remove the Chute Assembly.
3. Remove the Plate Base.
4. Disconnect J2731 from the Sensor Assembly (Horizontal).
5. Press in on the locking clips and remove the Sensor Assembly (Horizontal) from the Chute Assembly.

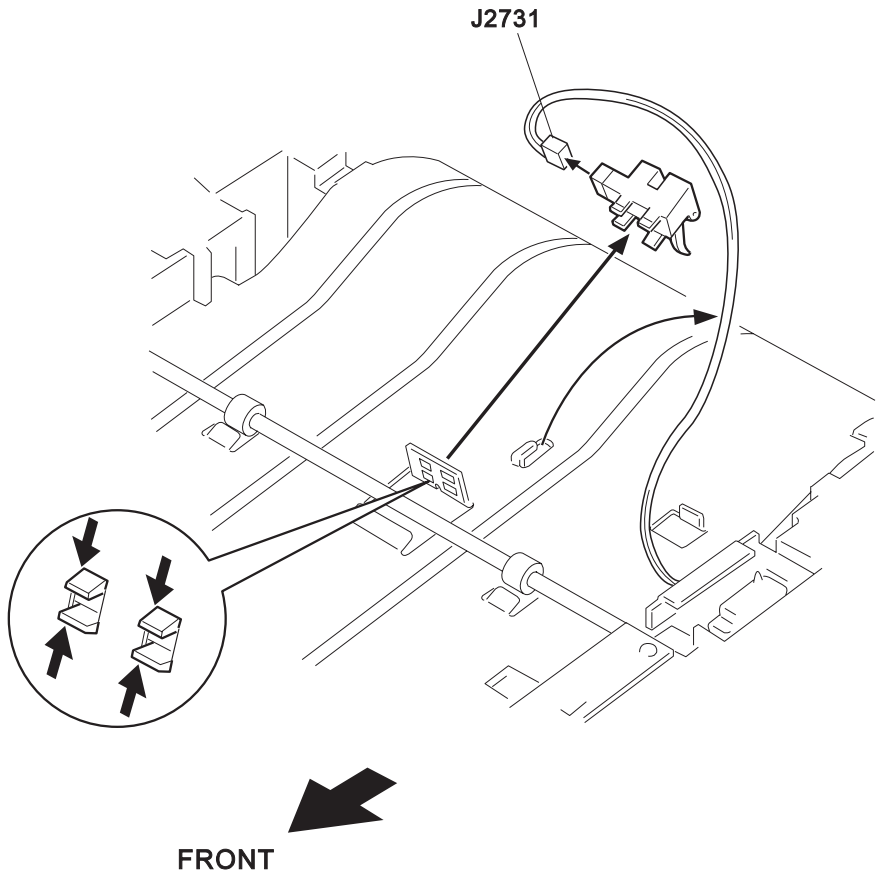


Figure 4-13. Sensor Assembly (Horizontal) Removal

4.2.14 Roll Assembly #1 & Pinch Roll

1. Remove the Duplex Unit.
2. Slide the end of the Plate Stopper off of the post on the Frame L/H. See illustration (1).
3. Tilt back the Duplex Assembly Unit Vertical.
4. Remove the Chute Upper.
5. Remove the two screws that are securing the Chute to the Supports Duplex R/H and L/H and remove the Chute (1).
6. Loosen the screw that secures the Rear Interlock Switch (PL11.1.8: Bracket Sensor) to the Duplex Unit Horizontal II (PL11.2) (2).
7. Remove the E-rings from both ends of Roll Assembly #1.
8. Remove the bearing from the right end of the Roll Assembly #1.
9. Remove the gear and bearing from the left end of the Roll Assembly #1.
10. Lift the shaft up and out of the Chute.
11. Slide the shaft to the right and out of the Chute.
12. Unhook and remove the two Springs that hold the Brackets Pinch to the Chute.
13. Remove the two Brackets Pinch along with the Roll Pinch from the Chute.
14. Remove the two Brackets Pinch from the ends of the Pinch Roll.

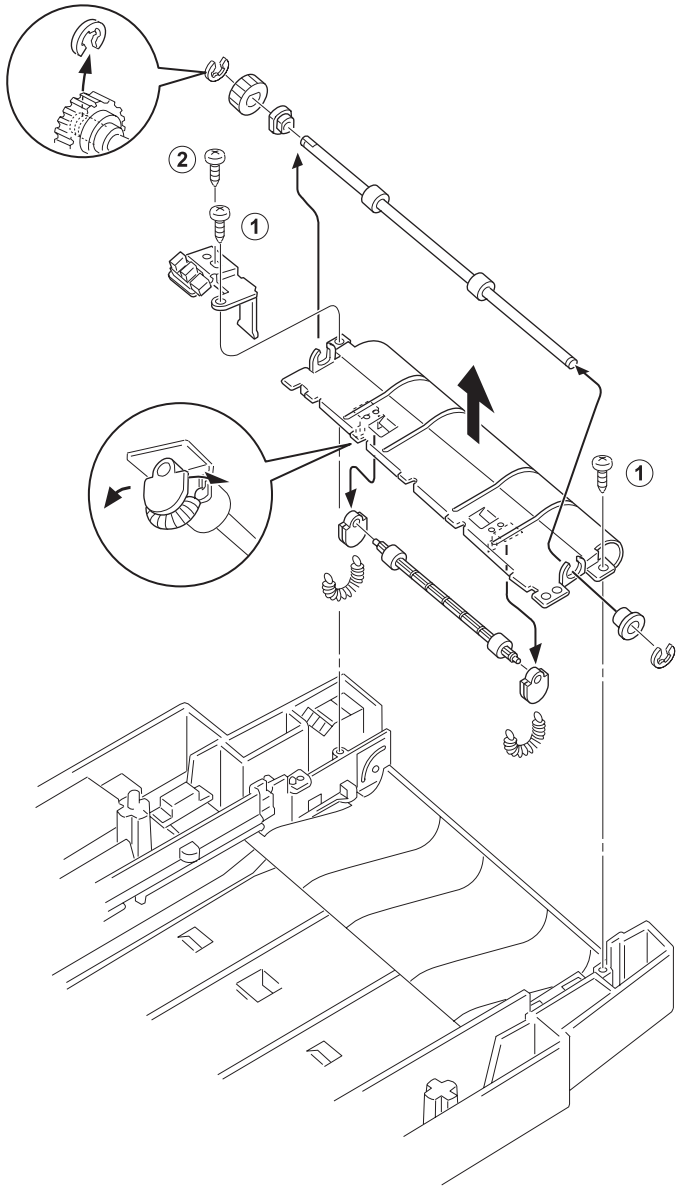


Figure 4-14. Roll Assembly #1/Pinch Roll Removal

4.2.15 Plate Base

1. Remove the Duplex Unit.
2. Slide the end of the Plate Stopper off of the post on the Frame L/H. See the illustration (1).
3. Tilt back the Vertical Unit.
4. Turn the Duplex Unit upside down.
5. Remove the eight screws that are securing the Plate Base to the Horizontal Unit, and remove the Plate Base.

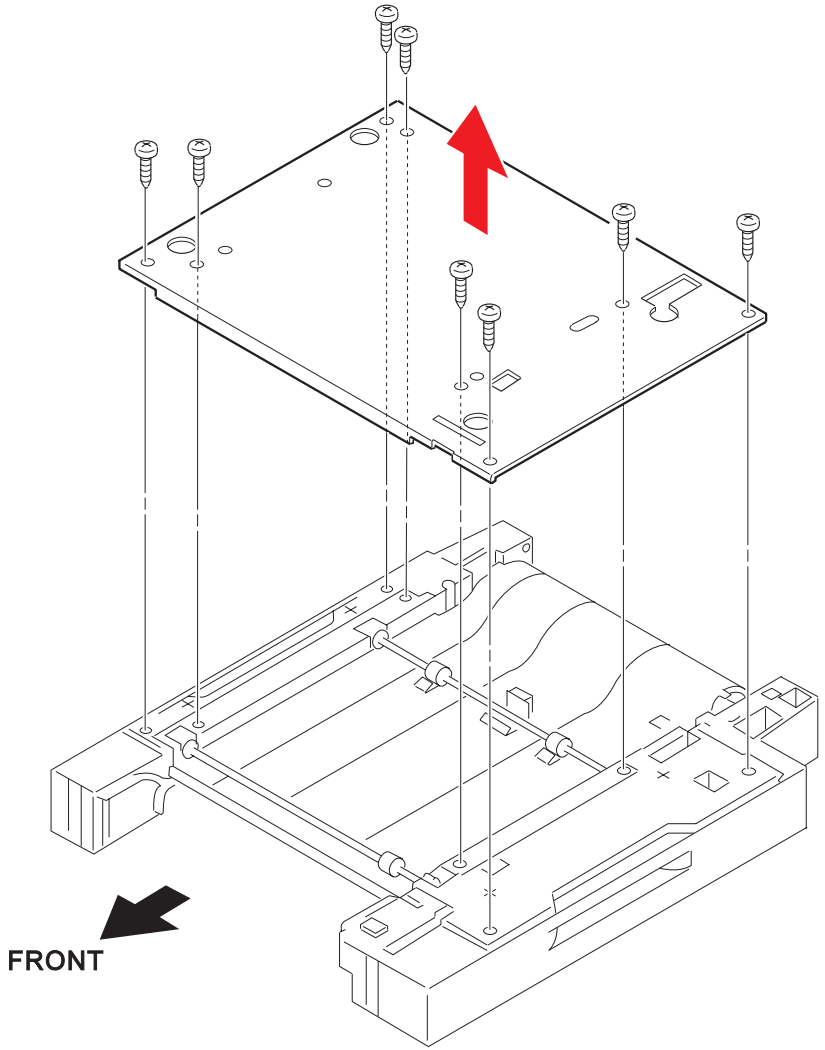


Figure 4-15. Plate Base Removal

4.2.16 Roll Assemblies #2 & #3

1. Remove the Duplex Unit.
2. Remove the Plate Base.
3. Set the Horizontal Unit on the Support Duplex L/H-.
4. Remove the two screws that are securing the Chute Assembly to the Support Duplex-R/H.
5. Carefully pull the Chute Assembly a few inches away from the Support.
6. Remove the E-ring from the end of Roll Assembly #2 (shaft with two rubber rolls).
7. Remove the bearing from the top end of Roll Assembly #2.
8. Slide the Roll Assembly #2 down to free the bearing at the bottom end of the Assembly.
9. Pull the top end of the Roll Assembly #2 away from the Horizontal Unit and remove the Assembly.
10. Remove the E-ring from the end of Roll Assembly #3 (shaft with one rubber roll).
11. Remove the bearing from the top end of Roll Assembly #3.
12. 1Slide Roll Assembly #3 down to free the bearing at the bottom end of the Assembly.
13. Pull the top end of the Roll Assembly #3 away from the Horizontal Unit and remove the Assembly.

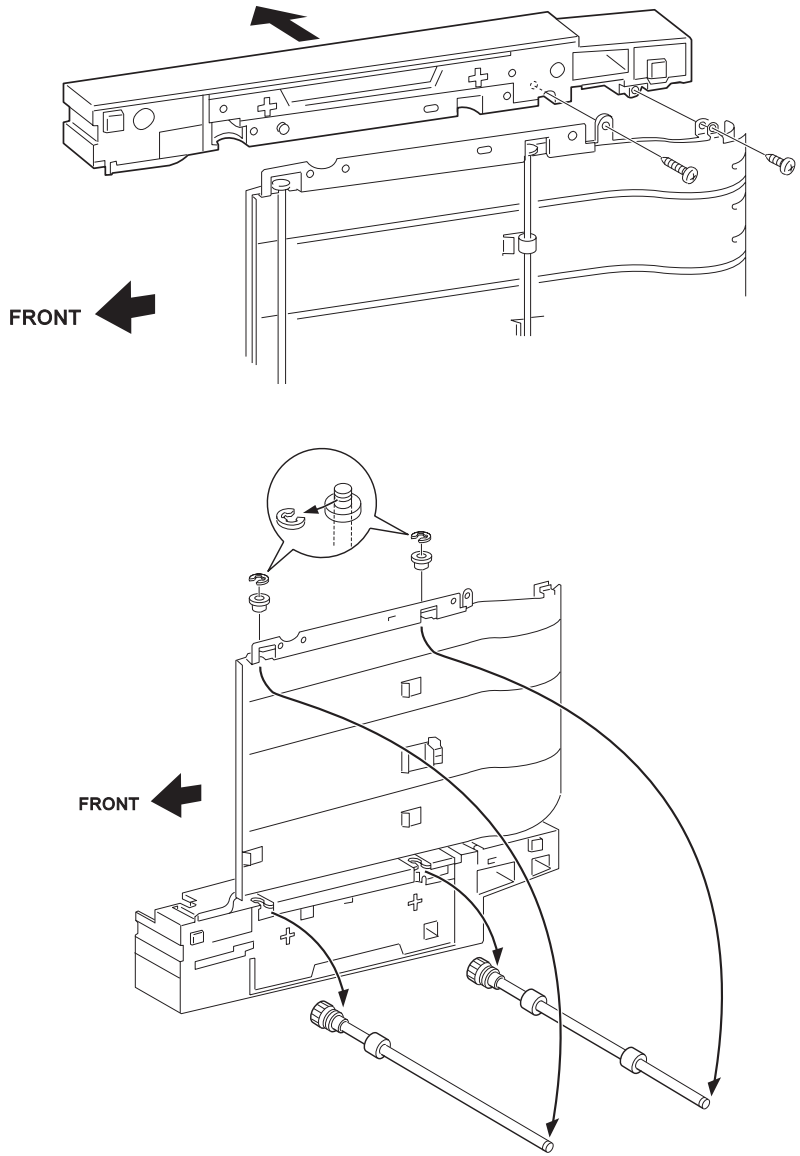


Figure 4-16. Roll Assemblies #2/#3 Removal

4.2.17 PWB Assembly Duplex

1. Remove the Duplex Unit.
2. Disconnect J263, J272, J273, and J274 from the PWB Assembly Duplex.
3. Remove the screw that is securing the PWB Assembly Duplex to the Support Duplex-L/H.
4. Slide the end of the PWB out of the slot in the Support Duplex L/H and remove the PWB.

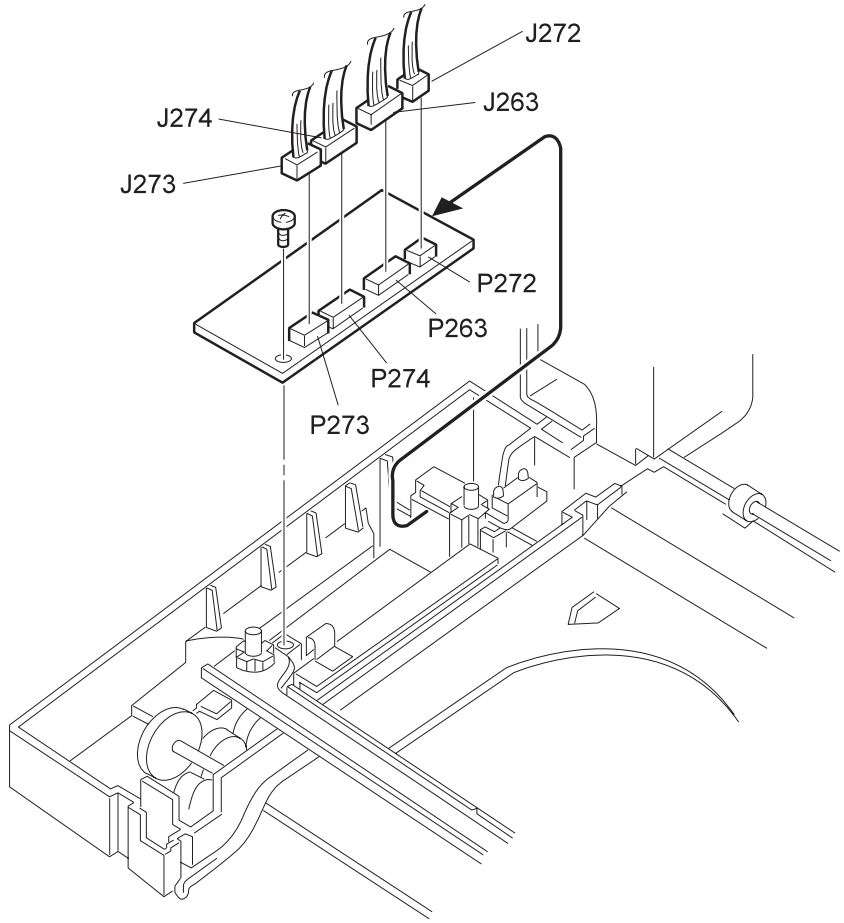


Figure 4-17. PWB Assembly Duplex Removal

4.2.18 Bracket & Gear Assembly

1. Remove the Duplex Unit.
2. Remove the PWB Assembly Duplex.
3. Slide the Chute Assembly out from the Duplex Unit.
4. Remove the two screws that are securing the Plate Tie to the Support Duplex-L/H and Support Duplex-R/H, and remove the Plate Tie.
5. Remove the three screws that are securing the Bracket & Gear Assembly to the Support Duplex L/H. The rear screw also secures a ground wire to the Bracket. The middle screw also secures the Bracket PWBA to the Gear Assembly Bracket.
6. Pull up and tilt back the Gear Assembly as you carefully remove the Gear Assembly from the Support Duplex L/H.

CAUTION

The Gear Assembly gears are not secured to their respective shafts, and they can slide off during Gear Assembly removal. Tilt the Gear Assembly back to keep the gears in place during removal and replacement.

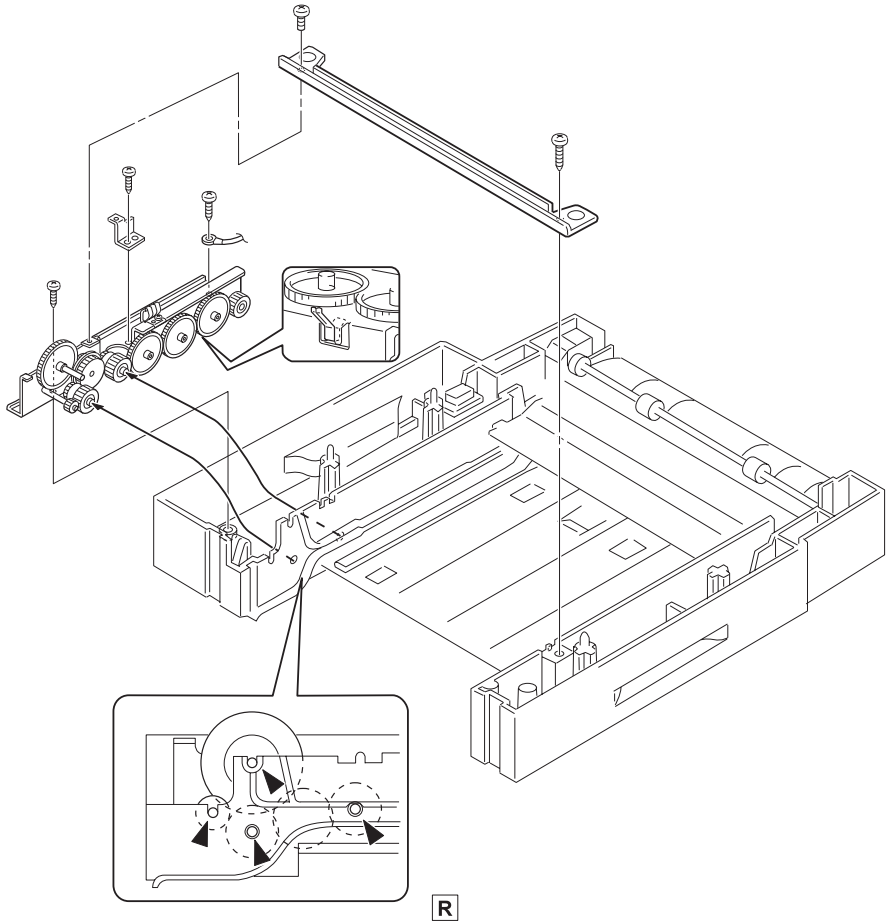


Figure 4-18. Bracket & Gear Assembly Removal

CHAPTER

5

ADJUSTMENT

There is no adjustment required when repairing the Duplex Unit.

CHAPTER

6

MAINTENANCE

There is no specific maintenance required for the duplex unit.

CHAPTER

7

APPENDIX

7.1 Connector Location

Connector	Location	Harness
J229 P/J230	6	Harness Sensor Horizontal Harness Vertical
P/J244	9	Harness Vertical
P/J246	10	Harness Vertical
P/J247 J2471	8	@ Solenoid *1 Harness Vertical
P/J249 J2491	7	@ Fan Assembly Duplex Harness Vertical
J252	5	Harness 15P
P/J263	3	Harness 15P
P/J272	4	Harness 7P
P/J273	1	Harness Sensor 9P
P/J2731	13	Harness Sensor 9P
P/J2732	11	Harness Sensor 9P
P/J2733	12	Harness Sensor 9P
P/J274	2	Harness Sensor Horizontal
P/J282	14	Harness 7P

*1: "@" mark at the beginning of a harness name indicates that the subject harness is a part of the component from where the harness extends.

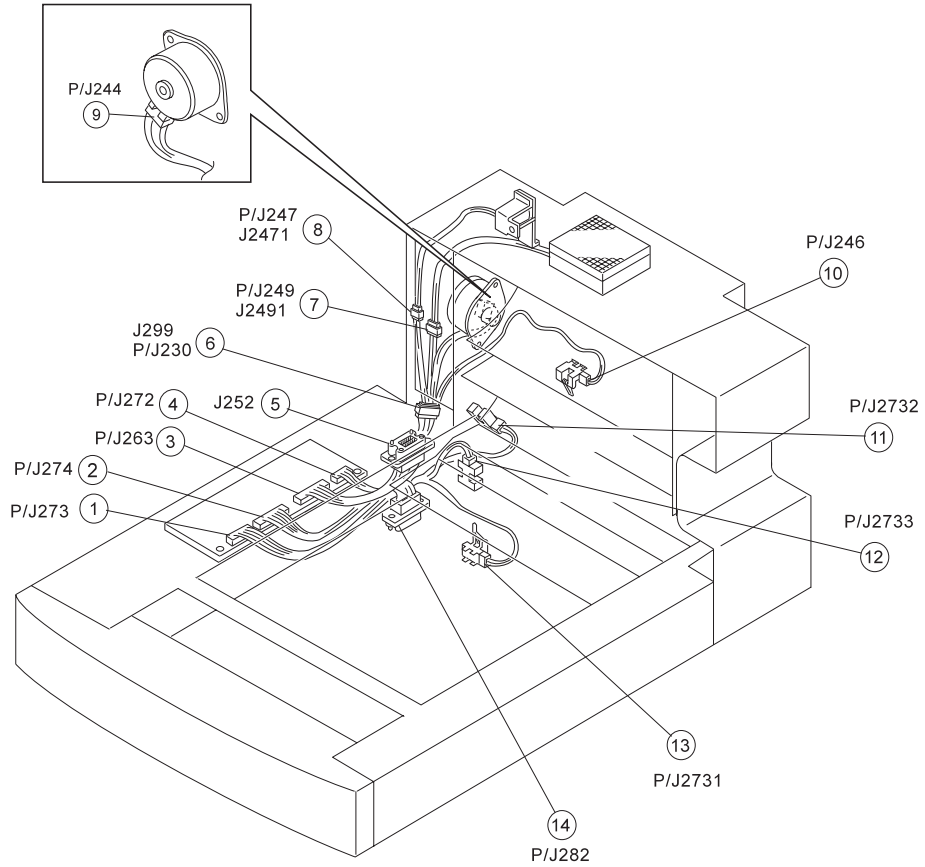


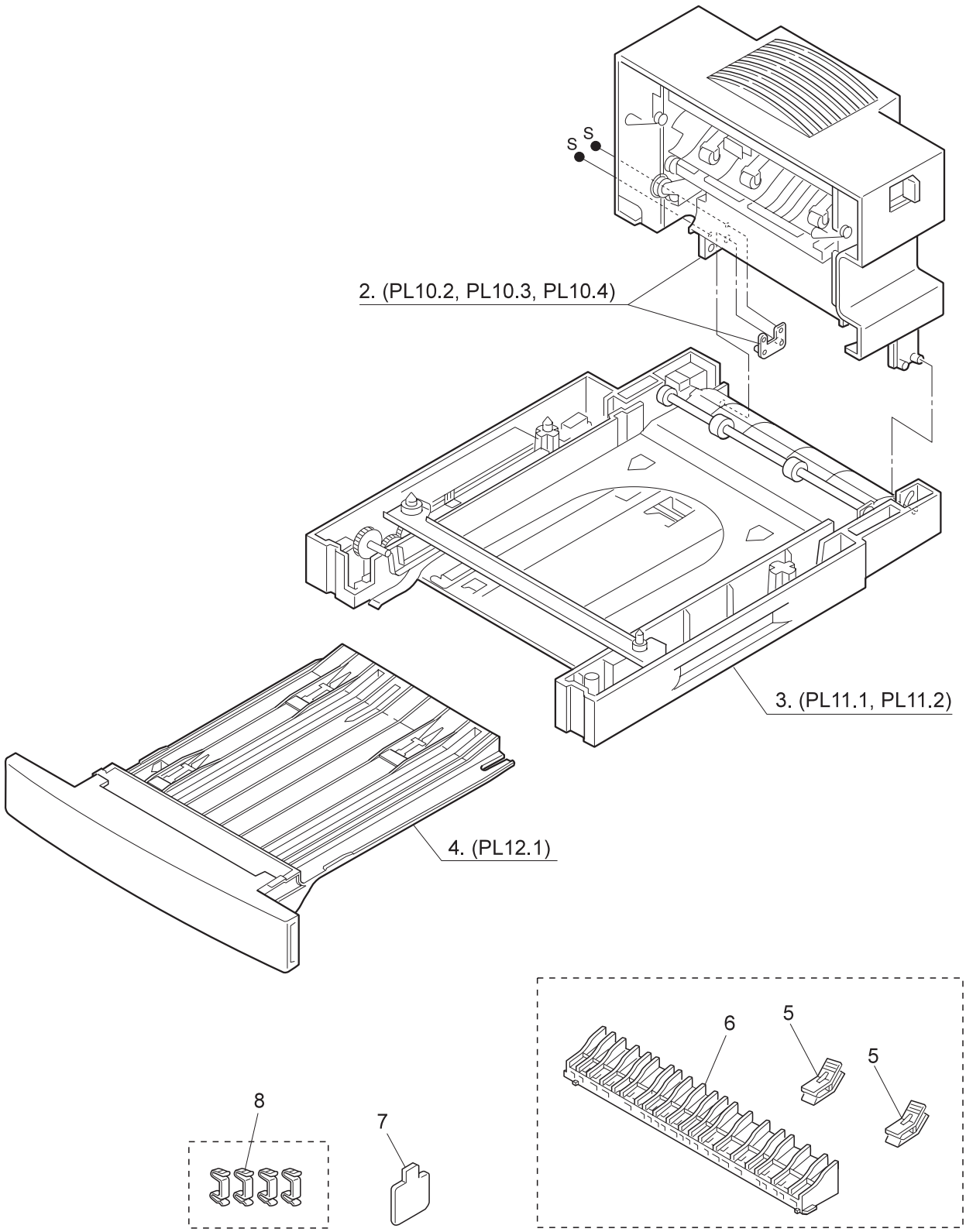
Figure 7-1. Connector Location Diagram

7.2 Exploded Diagram

DUPLEX UNIT (OPTIONAL)

1. Duplex Unit
   (with PL10.2, PL10.3, PL10.4, PL11.1, PL11.2, PL12.1 and 5~8)
2. Reference only (Exploded on PL10.2, PL10.3, PL10.4)
3. Reference only (Exploded on PL11.1, PL11.2)
4. Reference only (Exploded on PL12.1)
5. Clip Chute $
6. Chute Duplex
7. Plate Cap
8. Joint Feeder (PL9.1.22) $

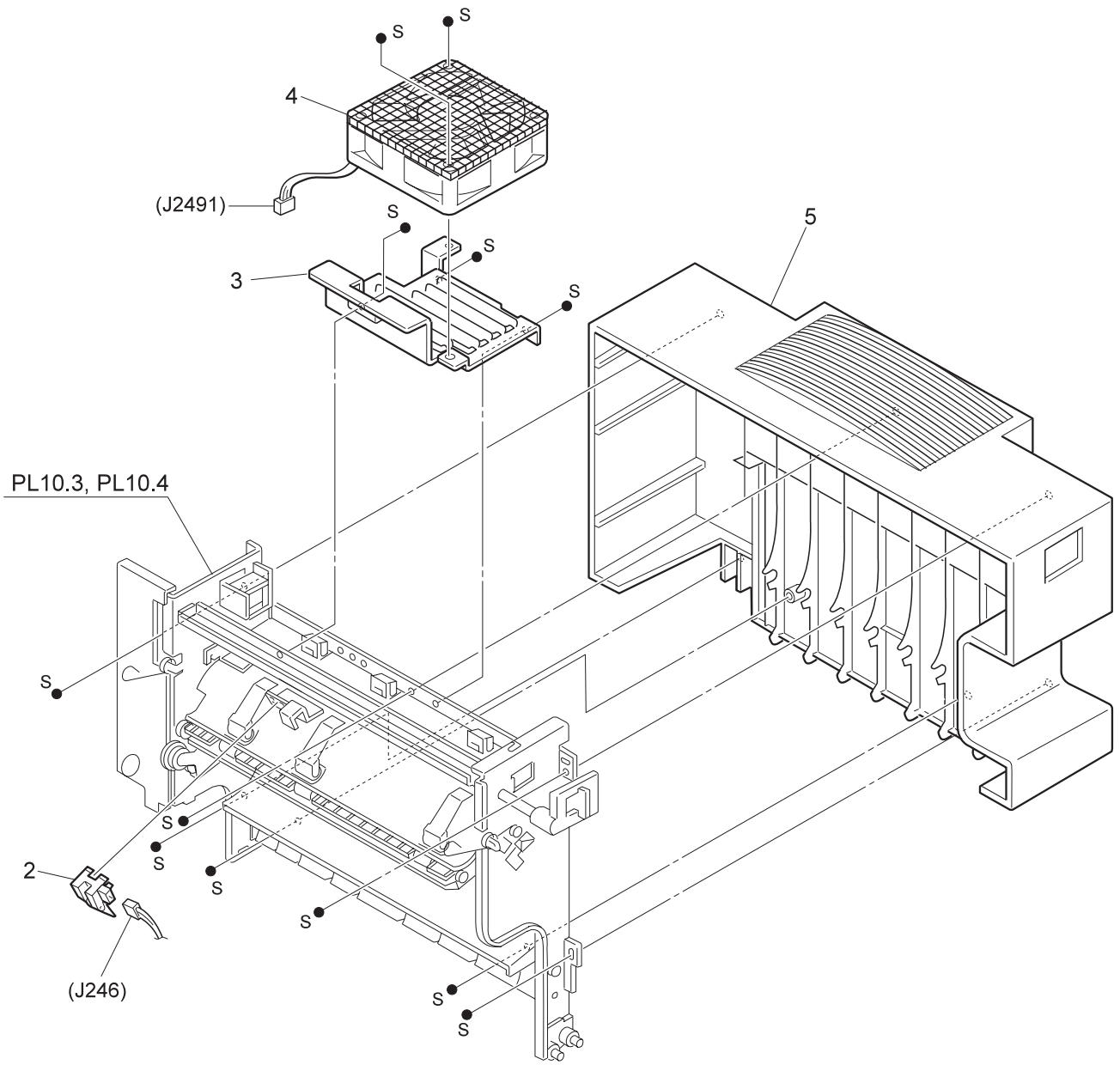
▼ 1 (with PL10.2, PL10.3, PL10.4, PL11.1, PL11.2, PL12.1 and 5~8)



DUPLEX UNIT VERTICAL I

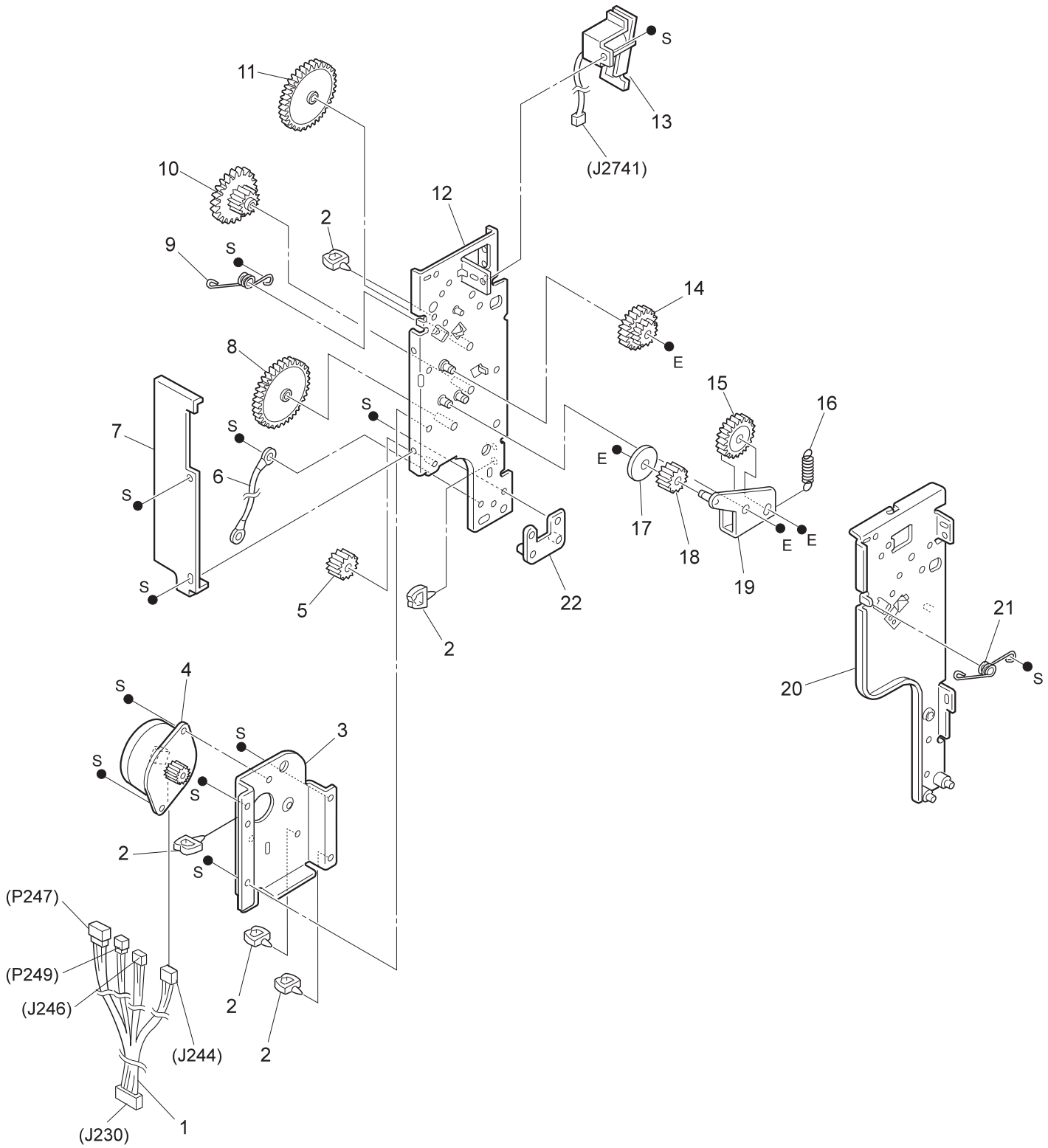
1. Duplex Assembly Unit Vertical (with 2 - 5, PL10.3, PL10.4) $
2. Sensor Assembly $
3. Bracket Fan
4. Fan Assembly Duplex $
5. Chute Cover
6. --

▼ 1 (with 2~5, PL10.3, PL10.4)



DUPLEX UNIT VERTICAL II

1. Harness Vertical
2. Clamp NSB1207
3. Bracket
4. Motor Duplex $
5. Gear
6. Wire
7. Plate Cover
8. Gear
9. Spring Torsion-Latch LH
10. Gear
11. Gear
12. Frame L/H
13. Solenoid $
14. Gear
15. Gear Idler
16. Spring Extension
17. Roll Tracking
18. Gear Idler
19. Bracket
20. Frame R/H
21. Spring Torsion-Latch RH
22. Plate Assembly Pivot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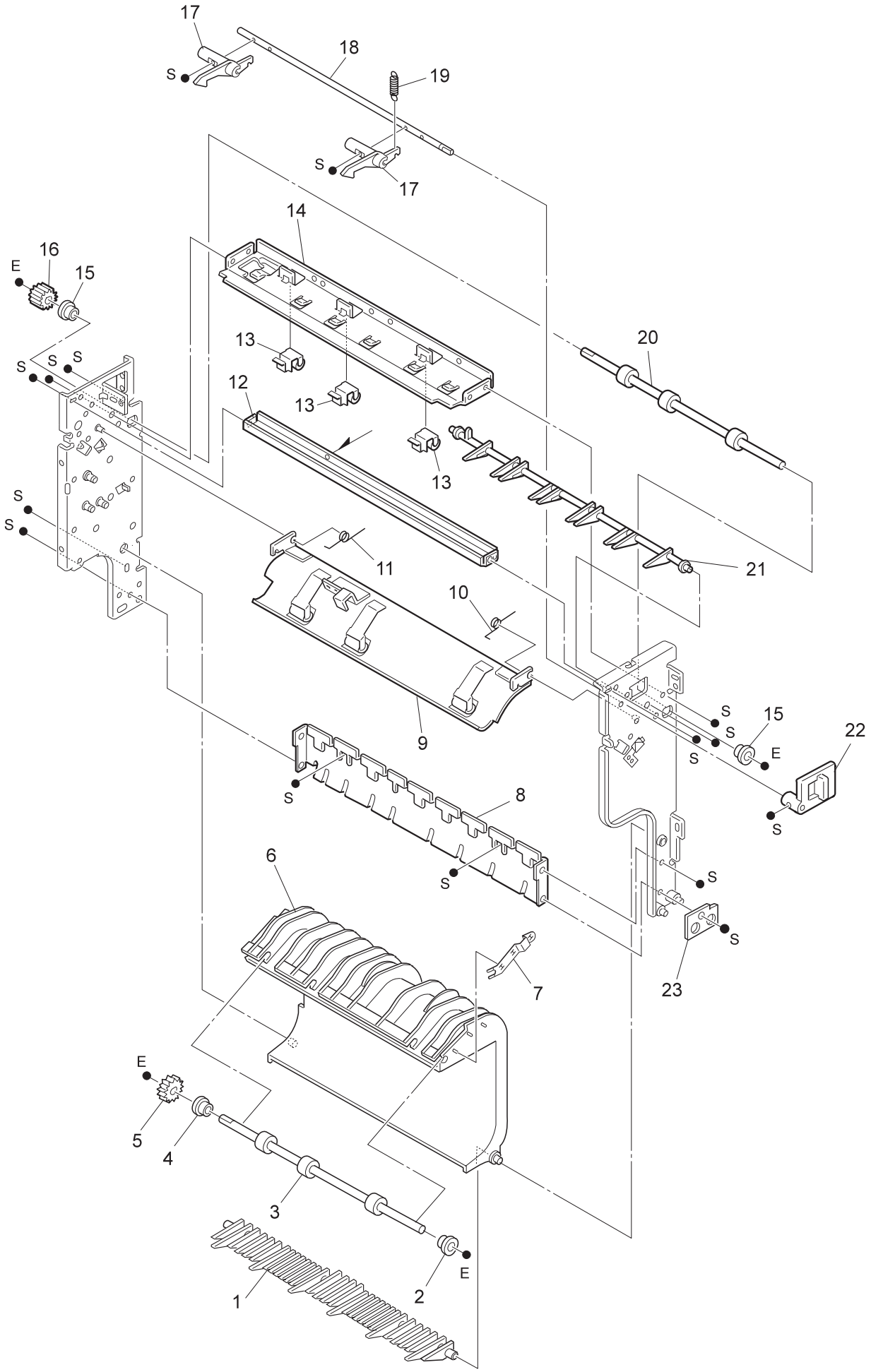
(P247)
(P249)
(J246)
(J244)
(J230)

DUPLEX UNIT VERTICAL III

1. Chute Lower
2. Bearing
3. Roll Assembly
4. Bearing
5. Gear
6. Chute Lower
7. Spring Earth
8. Chute Invert-V/TRA
9. Chute Upper
10. Spring R
11. Spring L
12. Plate Tie
13. Roll Pinch
14. Chute Upper 2
15. Bearing
16. Gear
17. Latch
18. Shaft Latch
19. Spring
20. Roll Assembly Exit
21. Gate Upper
22. Lever
23. Bracket Pivot R/H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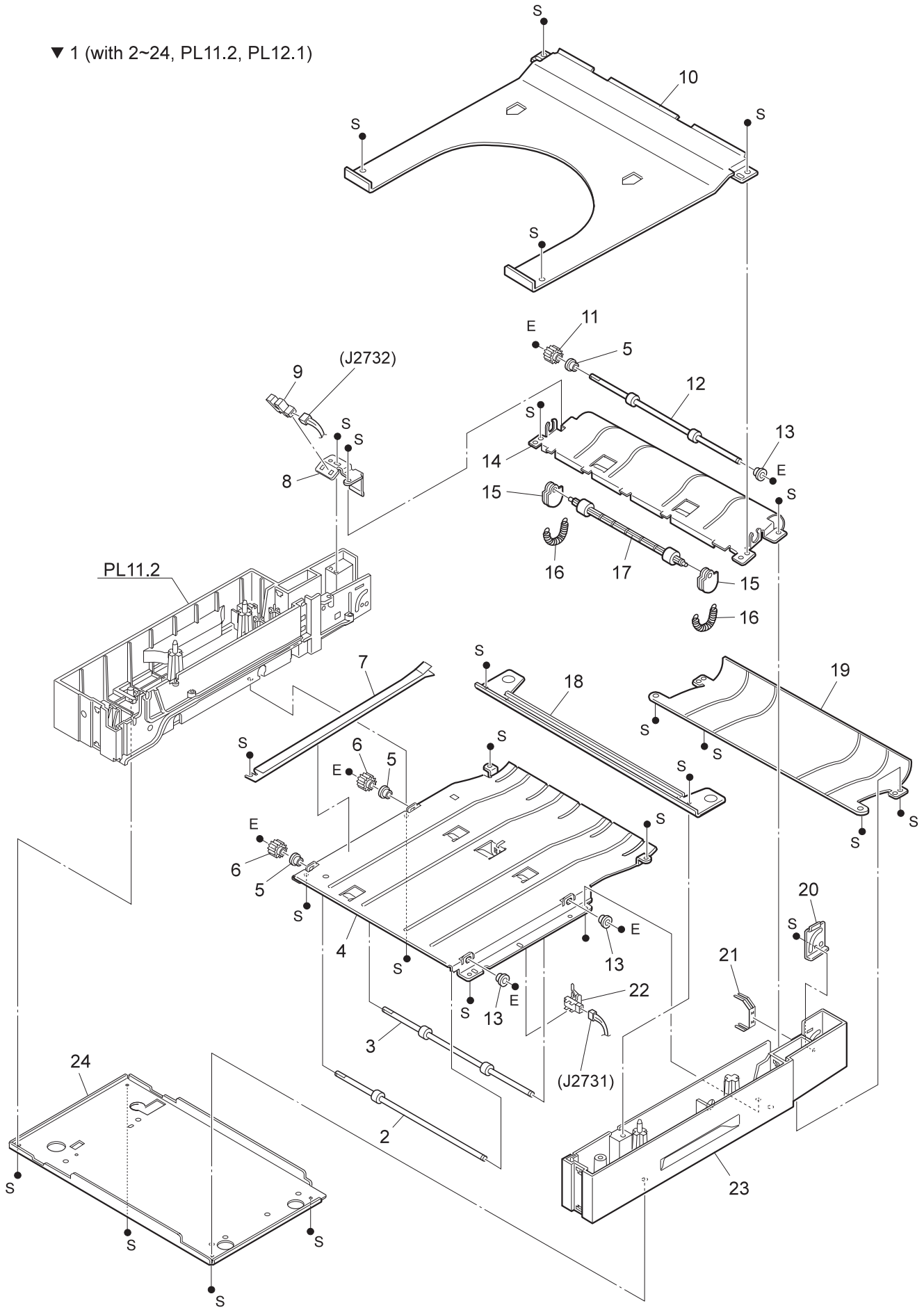
DUPLEX UNIT HORIZONTAL I

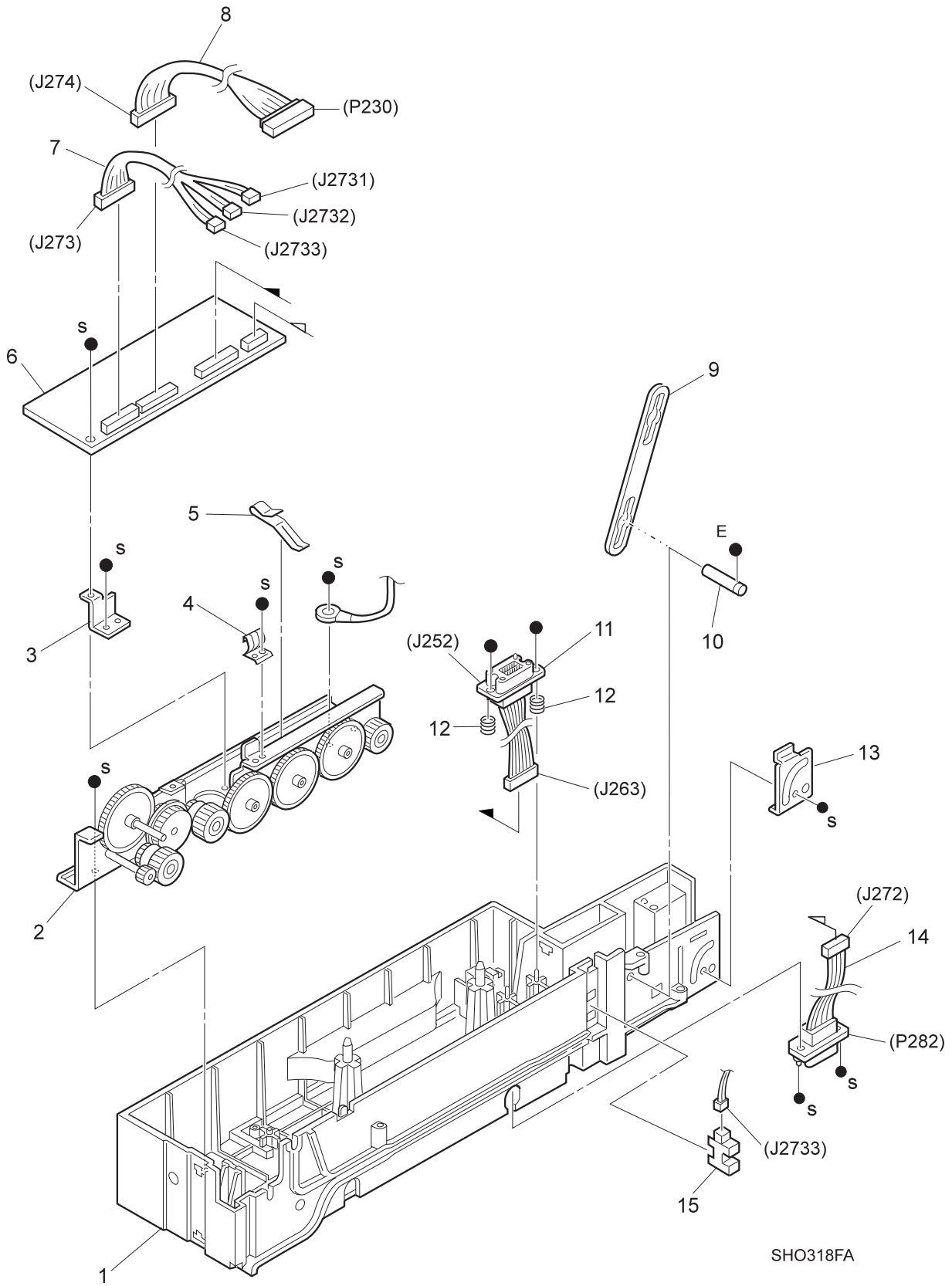
1. Duplex Assembly Unit Horizontal (with 2 - 24, PL11.2, PL12.1) $
2. Roll Assembly #3
3. Roll Assembly #2
4. Chute Assembly
5. Bearing
6. Gear Z16
7. Guide
8. Bracket Sensor
9. Photo Interrupter $
10. Chute Upper
11. GearA
12. Roll Assembly #1
13. Bearing
14. Chute
15. Bracket Pinch
16. Spring
17. Roll Pinch
18. Plate Tie
19. Chute Lower
20. Plate Pivot R/H
21. Spring Earth
22. Sensor Assembly $
23. Support Duplex-R/H
24. Plate Base

▼ 1 (with 2~24, PL11.2, PL12.1)



DUPLEX UNIT HORIZONTAL II

1. Support Duplex-L/H
2. Bracket & Gear Assembly
3. Bracket PWBA
4. Spring Earth
5. Spring Earth
6. PWBA Assembly Duplex $
7. Harness Sensor 9P
8. Harness Sensor Horizontal
9. Plate Stopper
10. Pin
11. Harness 15P
12. Spring
13. Plate Pivot L/H
14. Harness 7P
15. Photo Interrupter $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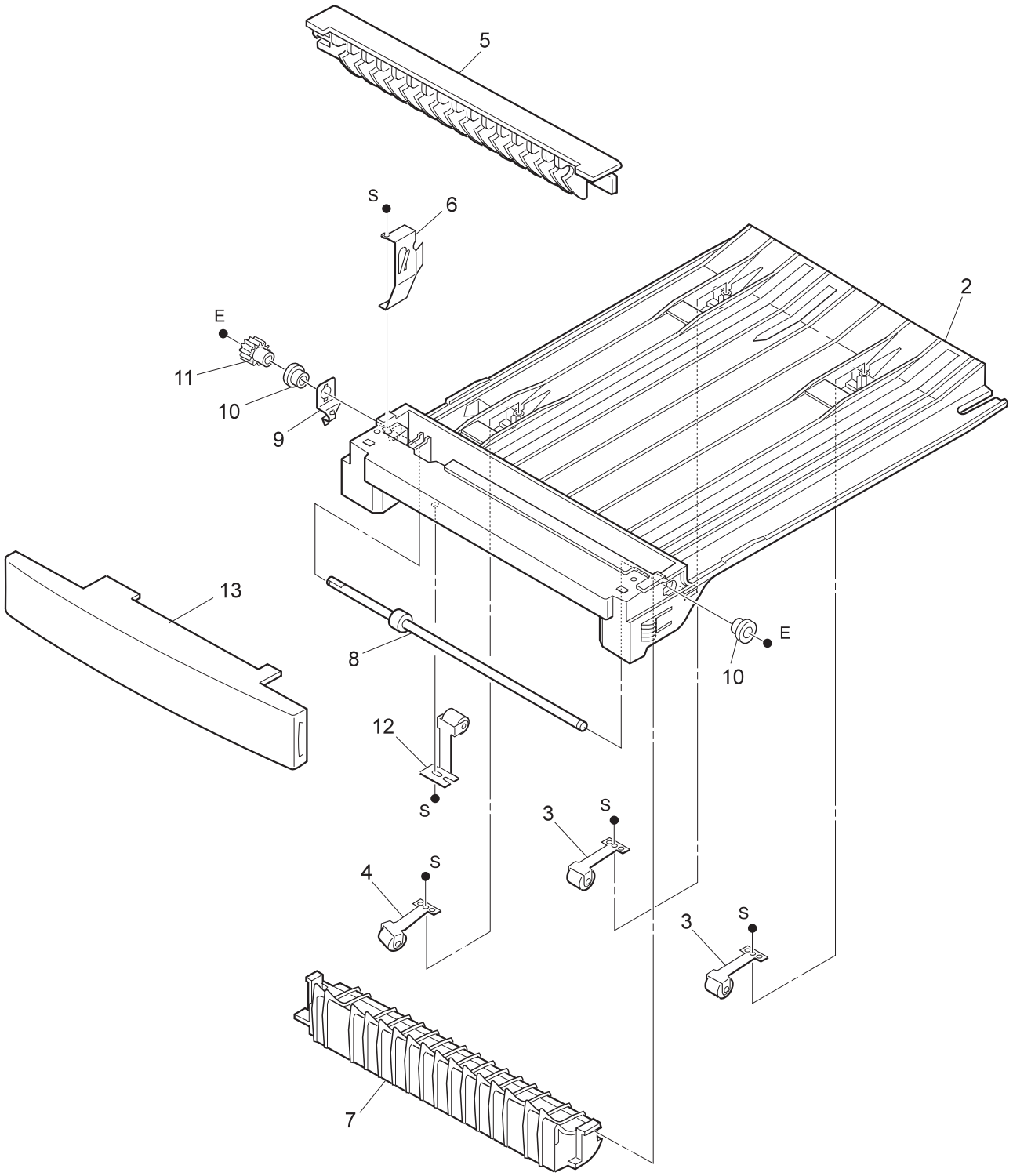
SHO318FA

DUPLEX UNIT CHUTE

1. Chute Assembly (with 2 - 13) $
2. Chute
3. Roll Pinch Assembly
4. Roll Pinch Assembly
5. Chute Pass A
6. Spring Earth
7. Chute Pass B
8. Roller Assembly # 4
9. Spring Earth
10. Bearing
11. Gear Z16
12. Roll Pinch Assembly
13. Cover Front

▼ 1 (with 2~13)



SERVICE MANUAL

EPSON EPL-N1600 Option

500 Sheets Feeder

COLOR IMAGING EPSON

EPSON®

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE

1. EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the 500 Sheets Feeder for the EPL-N1600. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS
Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in This Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read WARNING, CAUTION or NOTE messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Revision Status

Revision	Issued Date	Description
Rev. 0	August 17, 1998	Preliminary release. (intended for service training purpose only)
Rev. A	October 30, 1998	First release.

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CHAPTER

1

PRODUCT DESCRIPTIONS

1.1 OVERVIEW

This section describes the specification of the 500 Sheets feeder.

BASIC SPECIFICATION

Paper Separation:	By paper separation claw
Drive Source:	Driven by the base printer
Speed:	<With single side printing> A4 = 15.2PPM / Letter = 16.0PPM <With duplex printing> A4 = 7.8PPM / Letter = 8.0PPM
Paper Feed Origin:	Left edge of sheet

PAPER SPECIFICATION

Paper Type:	<Standard Paper> Xerox 4024DP 20 lb. (75g/m^2) paper <Normal Paper> 60 - 105 g/m^2 (16 - 28 lbs.) - PPC Paper - Bond paper - Recycled paper
Paper Size:	A4 (210 x 297mm) Letter (8.5 x 11 inch) G-Legal (8.5 x 13 inch) Legal (8.5 x 14 inch)

RELIABILITY/DURABILITY/SERVICEABILITY

MPBF:	120,000 sheets or more
MTBF:	3,000 hours or more
Life:	300,000 sheets or 5 years (whichever comes first)
Paper Feed Reliability *1:	<Jam rate> 1/3000 sheets or less (1/2000 or less : Duplex printing) <Misfeed> 1/3000 sheets or less (1/2000 or less: Duplex printing) <Multiple sheet feed> 1/800 sheets or less <Folded coners> 1C or more at 1/1000 sheets or less (1C or less is not included)

NOTE:

**1:With recommended paper and normal conditions*

MTTR:	30 minutes or less

DEMENSION AND WEIGHT

Dimension:	396 x 389 x 114 mm (W x D X H)
Weight:	4.6 Kg (Feeder + Cassette)

CHAPTER

2

OPERATING PRINCIPLES

2.1 OVERVIEW

This section describes the operating principles of the 500 Sheets feeder unit.

2.1.1 Paper Transportation

Paper that is fed from the 500 Sheet Feeder is transported through the printer along the paper path shown in the Figure right.

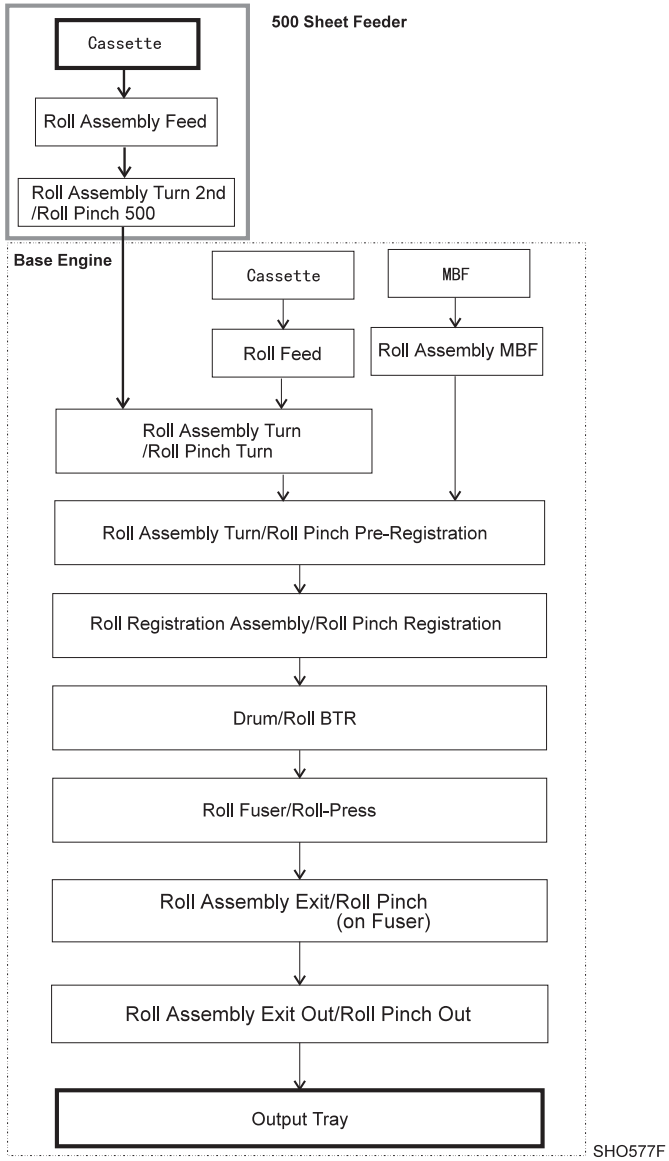


Figure 2-1. Paper Path

The Figure below is a cut-away side view of the EPL-N1600 with the optional 500 Sheet Feeder attached that shows the paper paths and the major components directly related to the paper transportation.

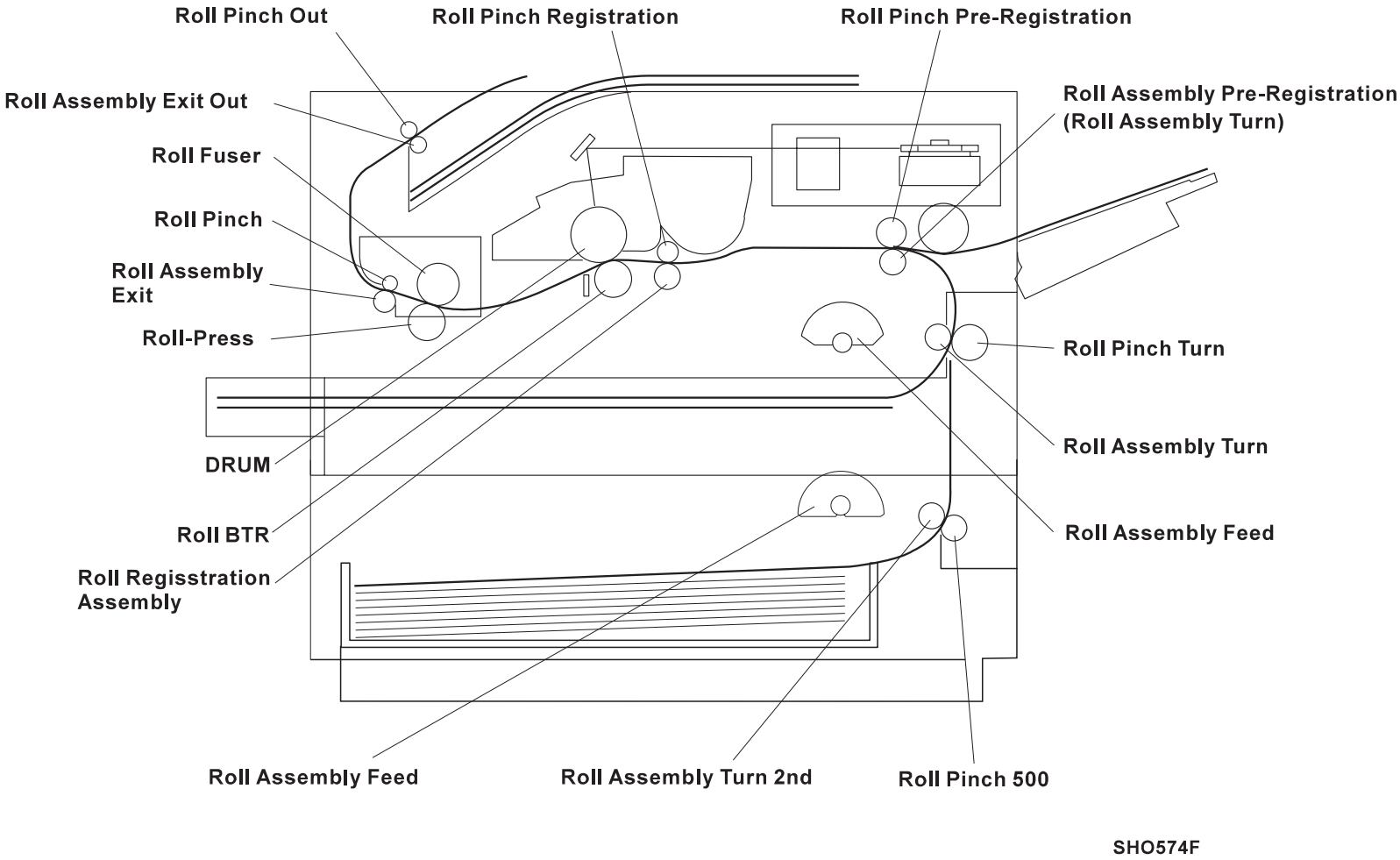


Figure 2-2. 500 Sheet Feeder Paper Path

2.1.2 Drive Power Transmission

The drive power to operate the 500 Sheet Feeder is supplied by the Paper Handling Motor of the Base Engine through the Drive Assembly.

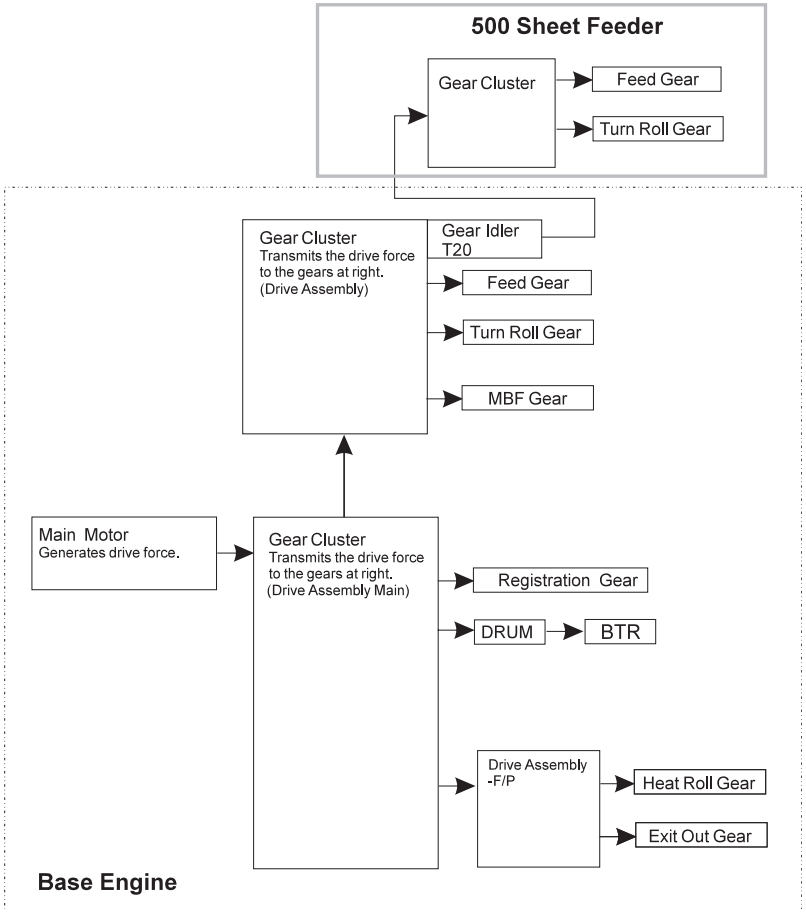


Figure 2-3. 500 Sheet Feeder Drive Power Transmission

The figure below shows the drive power transmission to 500 Sheet Feeder.

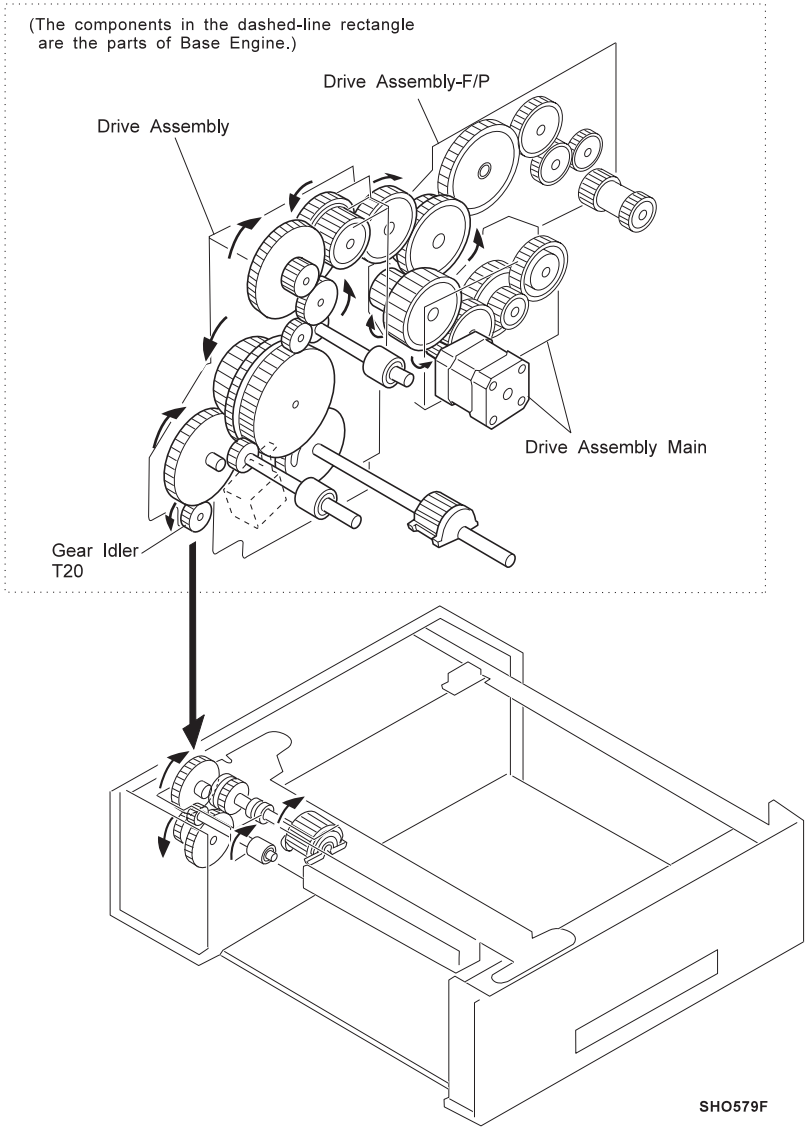
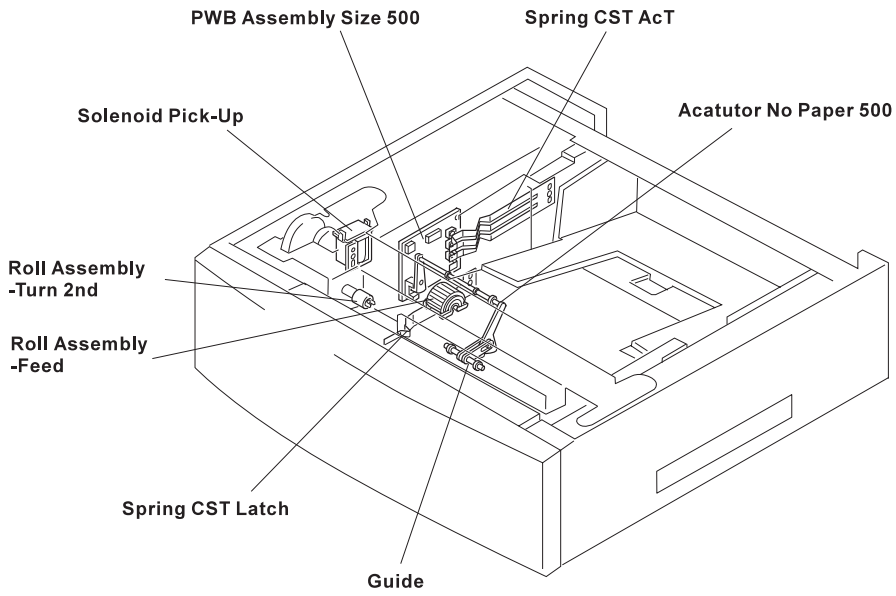


Figure 2-4. Drive Power Transmission

2.1.3 Function of Major Components



500 Sheet Universal Cassette: Universal paper cassette that holds 500 plain paper cut sheets of various regular sizes. You adjust the Cassette Guides to accommodate different paper sizes. Adjusting the Back Guide changes the position of the Actuators that are located along the left side of the cassette. When the cassette with paper loaded is installed in the Feeder, the Actuators press against the Size Spring.

Envelope/Postcard Cassette: Holds standard envelopes and postcards. See Section 16 500 Sheet Feeder Specification.

PWB Assembly Size 500: A Spring CST Act, three Paper Size Switches, and the No-Paper Sensor are mounted on the Size PWB.
Spring CST Act: has three prongs. The Actuators on the side of the Paper Cassette press against individual prongs. Each prong in turn press against a Paper Size Switch.
Paper Size Switches: A Size Switch is On when the corresponding spring prong presses against it, and Off when the corresponding spring prong does not press against it. The combination of On and Off Size Switches represents the size o the paper that is loaded in the Cassette.
No Paper Sensor: When the Paper Cassette is empty, the Actuator No Paper 500 actuates the No Paper Sensor.

Spring CST Latch: Secures the 500 Sheet Feeder in place in the Feeder.

Solenoid Pick-Up: Releases the Gear Feed to allow it to engage with the drive gear and rotate one turn when actuated, and latches the Feed Gear after one turn. This causes the Roll Assembly Feed to rotate one turn.

Roll Assembly Feed: Is a D-shaped roll that is driven to rotate one turn each time the Solenoid Pick Up is actuated.

Roll Assembly Turn 2nd: Transports, along with the Roll Pinch that is located in the Cassette, paper out of the Cassette into the Base Engine paper path.

2.1.4 Paper Jam Detection

A paper jam between the 500 Sheet Feeder and the Sensor Pre-registration (Misfeed jam) is detected using the E_{2-1} time. The E_{2-1} time is a time interval from Solenoid Pick-Up actuation to Sensor Pre-registration actuation. If the paper fed from the 500 Sheet Feeder do not actuate the Sensor Pre-registration within this time interval, the MCU interprets that a Misfeed jam has occurred and displays Error (Feed jam).

The E_{2-1} time for the 500 Sheet Feeder (cassette 2) is 2.036 seconds.

CHAPTER

3

TROUBLESHOOTING

This chapter is not applicable to the 500 sheets Feeder.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 OVERVIEW

This section contains the removal and replacement procedures of major parts or subsystems within optional Feeder Assembly 500 of the EPL-N1600.

4.1.1 Precautions

Be sure to carry out all work in accordance with the precautions provided below to avoid damaging the unit during disassembly and assembly.

CAUTION

- **Names of parts that appear in this chapter may not be exactly the same as the name appears in Parts List. For example, Roll Assembly Exit on the Parts List may appear as Roll Exit or Exit Roll in the RRPs, so far as it does not cause confusion. This is because of readability or conventions.**
- **Always use correct type and size screws. Using a wrong screw can damage a tapped hole. Do not over-tighten screws.**
- **Do not use excessive force to either remove or install a part.**

4.1.2 Tools

The following table lists the tools you need to disassemble and reassemble the printer.

Table 4-1. Required Tools

Tool	Market Availability	Code
Phillips screwdriver	Yes	B743800200
Tweezers	Yes	B641000100
Round nose pliers	Yes	B740400100

4.1.3 Removing Feeder Assembly 500

1. Disconnect the AC power cord to the rear of the printer.
2. Disconnect all interface Cables to the rear of the printer.
3. Remove the Paper Cassette from the Feeder Assembly 500.
4. Remove the 250 Sheet Paper Cassette (2). Remove the Duplex Chute Cover Assembly (2), if optional Duplex Unit is installed.
5. Press the Joint Feeder clips together and remove the two rear Joint Feeder clips securing the Feeder Assembly 500 to the printer or the Duplex Unit (1).
6. Press the Joint Feeder clips together and remove the two front Joint Feeder clips securing the Feeder Assembly 500 to the printer or the Duplex Unit (3).
7. Lift the base engine off of the Feeder Assembly 500. If the optional Duplex Unit is installed, first lift the base engine off of the Duplex Unit, then lift the Duplex Unit off of the Feeder Assembly 500.

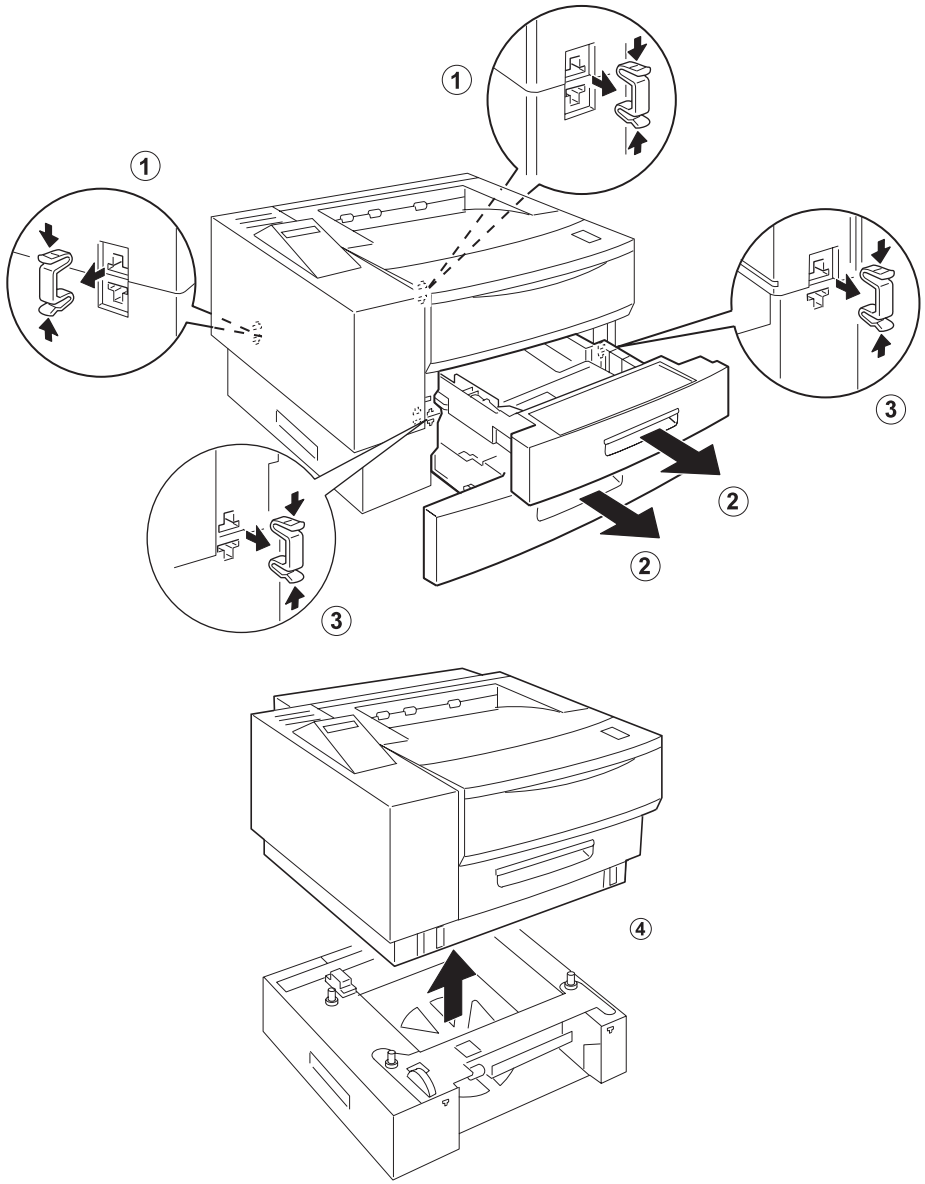


Figure 4-1. Removing Feeder Assembly 500

4.1.4 Frame 500 Removal

1. Remove the Feeder Assembly 500.
2. Remove the four screws that are securing the Frame Subassembly 500 to the Frame 500.
3. Push up on the Actuator No Paper 500 and raise the Subassembly off of the Frame 500.
4. Unhook the Solenoid Pick-Up wire harness from the harness clip.
5. Disconnect J322 on the Solenoid Pick-Up wire harness from the PWB Assembly Size 500.
6. Remove the Frame Subassembly.

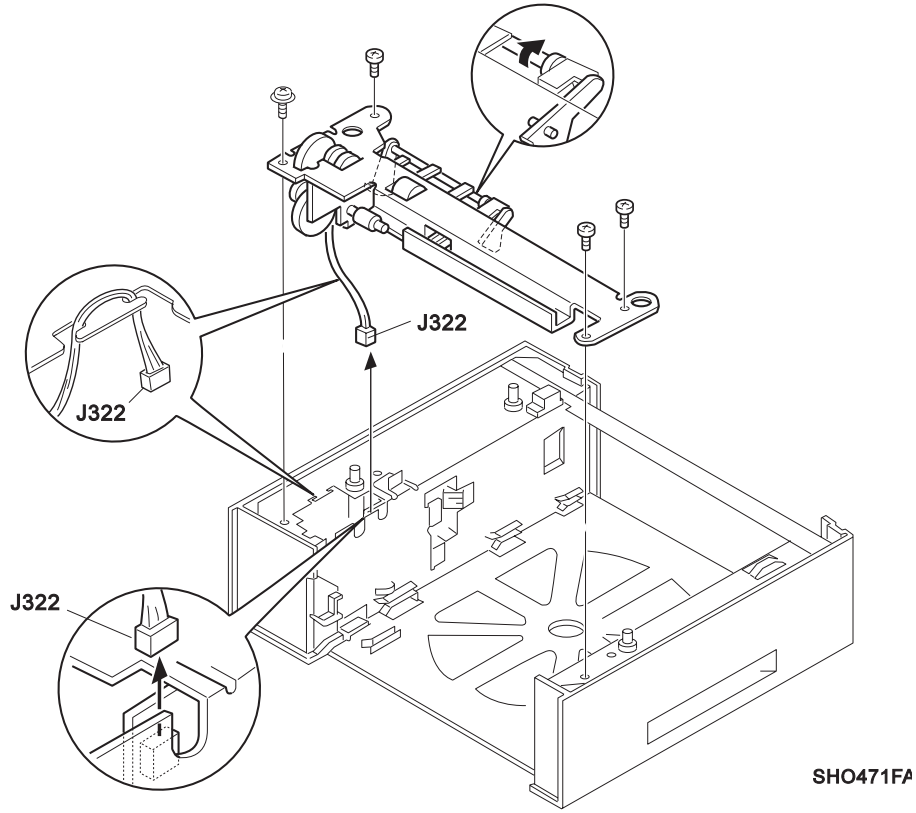


Figure 4-2. Frame 500 Removal

4.1.5 Solenoid Pick-Up Removal

1. Remove the Feeder Assembly 500.
2. Remove the Frame 500.
3. Remove the one screw that is securing the Solenoid Pick-Up to the Frame Subassembly 500.
4. Remove the Solenoid Pick-Up.

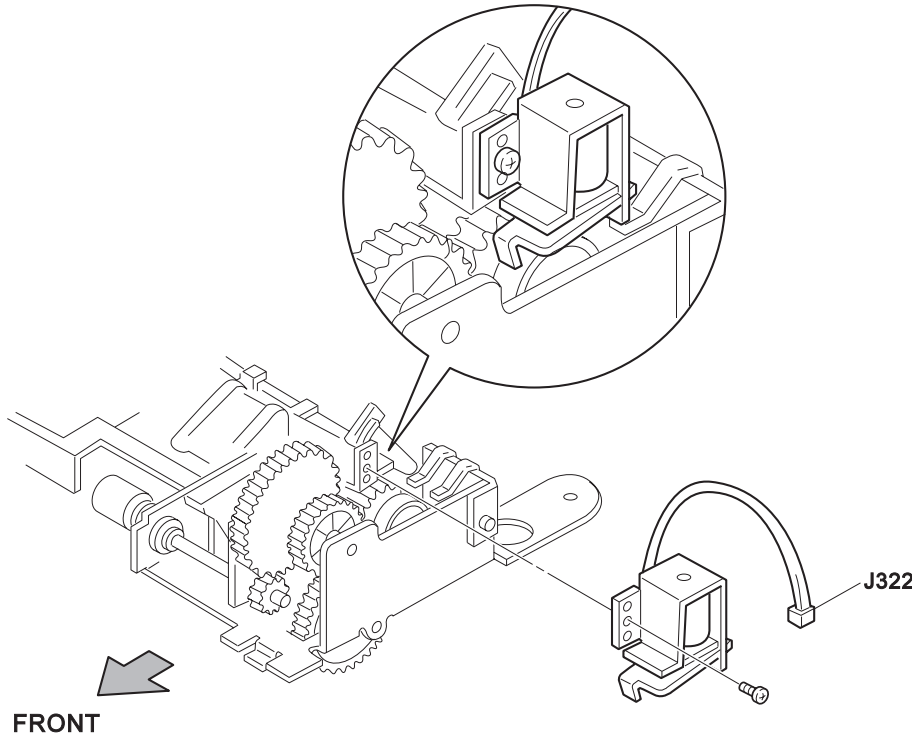


Figure 4-3. Solenoid Pick-Up Removal

4.1.6 Cover-L 500

1. Remove the Feeder Assembly 500.
2. Set the Feeder Assembly 500 on the right side (the Cover R 500 side).
3. Remove the two machine screws (screws with a flange), located on the bottom of the Feeder, that secure Cover-L 500 to the Frame 500.
4. Remove the three self-tapping screws, located on the top of the Feeder, that secure Cover-L 500 to the Frame 500.
5. If the Paper Cassette is installed, remove it from the Feeder Assembly 500.
6. Pull Cover-L 500 away from the Frame 500.

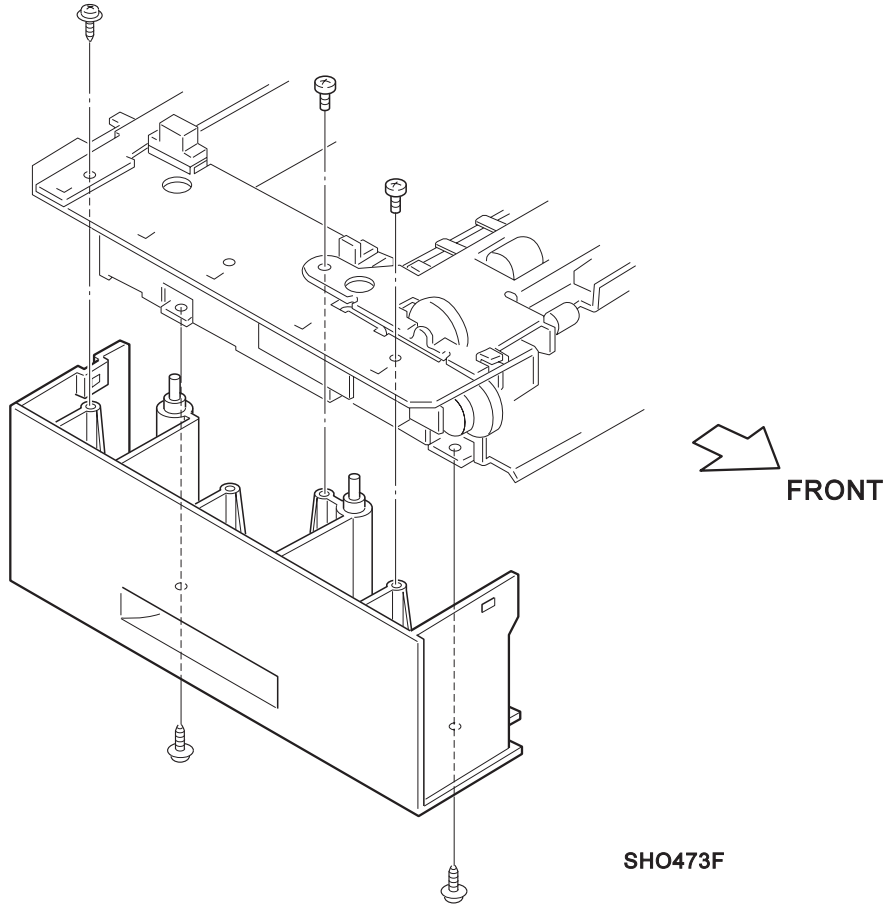


Figure 4-4. Cover-L 500 Removal

4.1.7 PWB Assembly Size 500 Removal

1. Remove the Feeder Assembly 500.
2. Remove the Cover-L 500.
3. Disconnect J302 from J292. Remove the two screws that secure the connector J292 bracket to the Frame 500, and cut the wire harness (1).
4. Remove the two screws that secure the PWB Assembly Size 500 to the Frame 500.
5. Slide the PWBA Size out of the retaining clips.
6. Remove the PWBA Size.
7. Disconnect J285 from the PWBA Size.

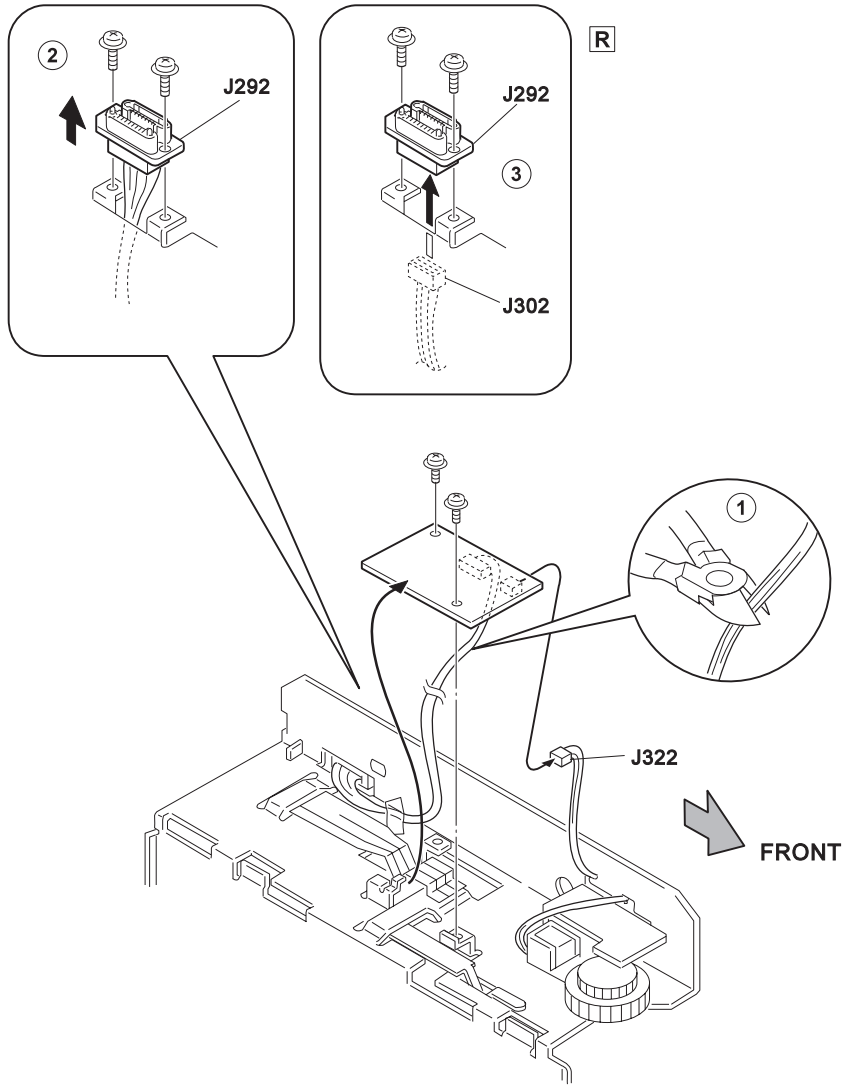


Figure 4-5. PWB Assembly Size 500 Removal

CHAPTER

5

ADJUSTMENT

There is no specific adjustment required for 500 sheets feeder.

CHAPTER

6

MAINTENANCE

No specific maintenance is required on the 500 Sheets Feeder.

CHAPTER

7

APPENDIX

7.1 Connector Location

Connector	Location	Harness
J292	E2	Connects the 500 Sheet Feeder to the PWB Assembly-Size 1 or PWBA Assembly Duplex.
J302	E3	Connects the 500 Sheet Feeder to the PWB Assembly-Size 1 or PWBA Assembly Duplex.
P/J322	E1	Connects the Solenoid Pick-Up to the PWB Assembly Size 500.

*1: "@" mark at the beginning of a harness name indicates that the subject harness is a part of the component from where the harness extends.

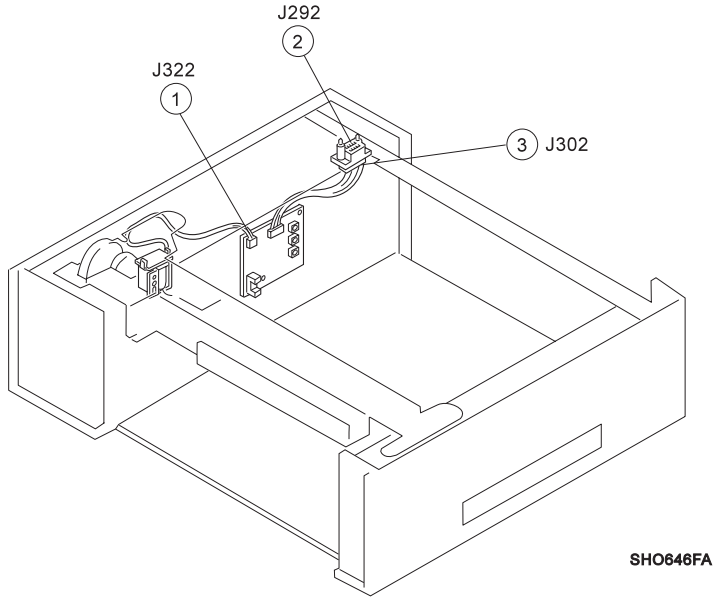


Figure 7-1. Connector Location Diagram

7.2 Master Wiring Diagram

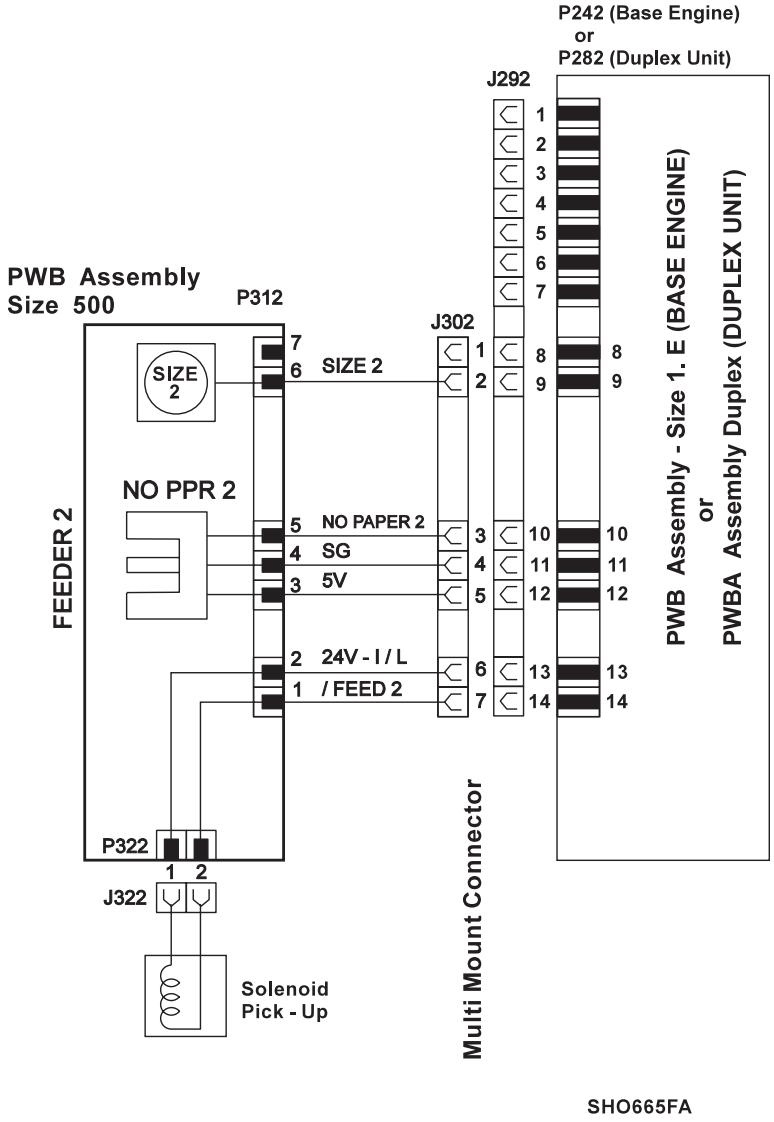


Figure 7-2. Wiring Diagram - 500 Sheets Feeder

Signal names for the Base Engine or Duplex Unit ↔ PWB Assembly Size 500 ↔ Solenoid Pick Up path

Signal Name	Description
/SIZE2	Signal for indicating the detected size of paper in the Cassette in Feeder 2. (Analog value)
NO PAPER	Signal for monitoring paper in Feeder 2 (High when paper is present and Low when paper is not present)
/FEED2	Signal for actuating the Solenoid feeding paper in Feeder 2.

Pin numbers and voltage levels for the Base Engine or Duplex Unit ↔ PWB Assembly Size 500 ↔ Solenoid Pick-Up path

P312	P242 or P282	Signal Name	Signal Direction M: PWBA MMCU S: PWBA Size 500	Trigger	High Level	Low Level
6	9	SIZE2	M ← S	-	*	*
5	10	NO PAPER2	M → S	Level	TTL	TTL
1	14	/FEED2	M → S	Level	24 V	0 V

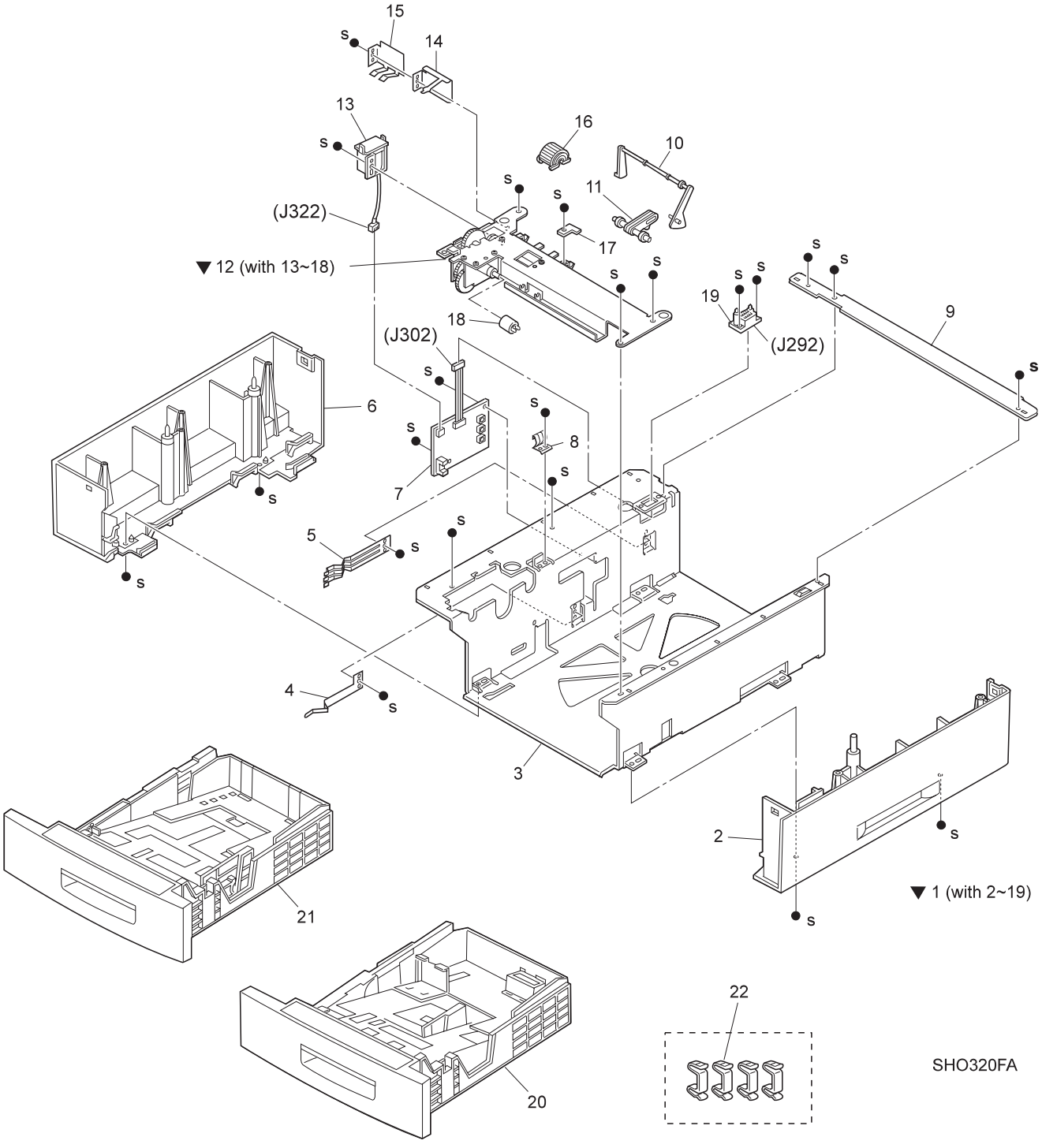
Relationship between paper sizes, pattern of actuated Paper SizeSwitches, and voltage of the SIZE signal for 500 Sheet Feeder

Paper Size	SW1	SW2	SW3	Signal Voltage (VDC)
Cassette not in place	0	0	0	0.45
Letter SEF	0	0	1	2.19
A4 SEF	0	1	1	2.82
Legal 13"	1	1	0	2.40
Legal 14"	1	1	1	3.08

7.3 Exploded Diagram

500 SHEET FEEDER (OPTIONAL)

1. Feeder Assembly 500 (with 2-19) $
2. Cover R 500
3. Frame 500
4. Spring CST Latch
5. Spring CST Act
6. Cover-L 500
7. PWB Assembly Size 500 $
8. Spring-Earth Feeder
9. Tie Bar 500
10. Actuator No Paper 500
11. Guide
12. Frame Subassembly 500 (with 13-18) $
13. Solenoid Pick-Up (PL3.1.14) $
14. Spring Feed 500
15. Support Spring Feed
16. Roll Assembly Feed
17. Plate N/P
18. Roll Assembly Turn 2nd
19. Connector
20. Envelope/Postcard Cassette
21. 500 Sheet Universal Cassette
22. Joint Feeder (PL10.1.8) $


15
14
13
16
10
11
(J322)
17
▼12 (with 13~18)
18
(J302)
19
(J292)
9
6
8
7
5
4
3
2
▼1 (with 2~19)
21
20
22
SHO320FA